



ERS

ergoline Rehabilitation System

User Manual

201000111000 • Revision 1.0 • English

Manual

This manual was written with the utmost care. Should you nonetheless find details that do not correspond with the system, please let us know and we will correct the issue as soon as possible.

We reserve the right to modify the design and technical features of the device and are not bound by the information and illustrations provided in this manual.

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For your notes

1 INTRODUCTION

1.1 CE MARKING INFORMATION

The product ERS System bears the CE marking CE-123 (notified body TÜV SÜD Produkt Service GmbH, Ridlerstrasse 65, 80339 Munich, Germany) indicating its compliance with the provisions of the Council Directive 93/42/EEC about medical devices and fulfills the essential requirements of Annex I of this directive.

The product ERS System has been assigned to class IIb in accordance with Annex IX of the Directive 93/42/EEC.

The product fulfills the requirements of standard EN 60601-1 "Medical Electrical Equipment, Part 1: General Requirements for Safety" as well as the immunity requirements of standard EN 60601-1-2 "Electromagnetic Compatibility – Medical Electrical Devices".

Magnetic and electrical fields are capable of interfering with the proper performance of the device. For this reason make sure that all external devices operated in the vicinity of the equipment comply with the relevant EMC requirements. X-ray equipment, MRI devices, radio systems, and cellular telephones are possible sources of interference as they may emit higher levels of electromagnetic radiation. Keep the equipment away from these devices and verify its performance before use.

The country of manufacture appears on the device label.

1.2 LICENSE TERMS

By installing the software you accept the terms and conditions outlined below.

Subject of this agreement is the granting of a license to use the software program and the product documentation. Ergoline GmbH grants you a personal, non-exclusive and non-transferable right to use the software and documentation. The software program and the accompanying documentation are protected by copyright. The licensee shall comply with the provisions of copyright law.

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1.3 REVISION HISTORY

Revision	Date	Comments
Revision 1.0	5 April 2011	Applies to software version V2.5 and later

1.4 INTENDED AUDIENCE

This manual is geared for clinical professionals. Clinical professionals are expected to have working knowledge of medical procedures, practices, and terminology as required for completing these examinations.

1.5 STYLISTIC CONVENTIONS

Bold text indicates keys (softkeys and hardkeys). Examples: **Patient Setup**, **Start Training**.

Italicized text indicates software terms and product names. Examples: *Name*, *Patient ID*.

1.6 SAFETY INFORMATION

GENERAL INFORMATION

This manual is an integral part of the device. It should be available to the equipment operator at all times. Close observance of the information given in the manual is a prerequisite for proper device performance and correct operation and ensures patient and operator safety. **Please note that information pertinent to several chapters is given only once. Therefore, read the entire manual once. Also observe all instruction manuals supplied with other equipment, such as the PC or the ergometer.**

To ensure maximum patient safety, the specified measuring accuracy, and interference-free operation, we recommend using only original accessories available through Ergoline GmbH. The user is responsible if accessories from other manufacturers are used.

Ergoline GmbH is responsible for the effects on safety, reliability, and performance of the equipment only if

- assembly operations, extensions, readjustments, modifications, or repairs are carried out by Ergoline GmbH or persons expressly authorized by Ergoline GmbH for these tasks,
- the device is used in accordance with the instructions given in this manual.

The warranty does not cover damage resulting from the use of unsuitable accessories and consumables from other manufacturers.

Always consult with Ergoline GmbH if you intend to connect equipment not mentioned in this manual.

Parts and accessories must comply with the applicable safety standards of the IEC 60601 series and/or the system configuration must comply with the requirements of the collateral standard IEC 60601-1-1 "Safety Requirements for Medical Electrical Systems".

The power cords must be certified for use in the respective countries where the equipment is operated.

All publications reflect the equipment specifications and standards on safety of medical electrical equipment valid at the time of printing. All rights are reserved for devices, circuits, techniques, software programs, and names appearing in this manual.

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DEFINITIONS

The safety information in this manual is classified as follows:

Danger

indicates an imminent hazard. If not avoided, the hazard will result in death or serious injury.

Warning

indicates a hazard. If not avoided, the hazard can result in death or serious injury.

Caution

indicates a potential hazard. If not avoided, the hazard may result in minor injury and/or product/property damage.

SAFETY INFORMATION

Danger

• Explosion Hazard •

The ERS System is not designed for use in areas of rooms used for medical purposes where an explosion hazard may occur. Potentially explosive atmospheres may result from the use of flammable anesthetics, skin cleansing agents or disinfectants. Furthermore, great care must be exercised when the system is used in oxygen-enriched atmospheres. The atmosphere is considered to be oxygen-enriched when the room air contains more than 25% of oxygen or nitrous oxide.

Danger

• Shock Hazard •

- *Before use, verify that the equipment is in correct working order and operating condition. The cables and connectors, in particular, must be checked for signs of damage. Damaged cables and connectors must be replaced immediately, before use.*
- *Do not expose the equipment to direct sunlight to prevent system components from reaching inadmissible high temperatures. The equipment has no additional protection against the ingress of humidity.*
- *When disconnecting the device from the power line, remove the plug from the wall outlet first before disconnecting the cable from the device.*
- *Do not use multiple portable socket outlets (MPSO) to connect devices to the power line.*
- *If a printer is operated in the patient environment, the printer must comply with IEC 60601 requirements or it must be a modified printer with additional protective earth conductor (potential equalization).*
- *All devices of a system must be connected to the same electric circuit. Devices that are not connected to the same circuit must be electrically isolated when operated, e.g., by means of an isolated RS232 interface (not required in the USA).*
- *Devices may be connected to other devices or to parts of systems only when it has been made certain that there is no danger to the patient, the operators, or the environment as a result. In those instances where there is any element of doubt concerning the safety of connected equipment, the user must contact the manufacturers concerned or other informed experts as to whether there is any possible danger to the patient, the operator, or the environment as a result of the proposed combination of equipment. Standards IEC 60601-1-1/EN60601-1-1 must be complied with in all cases.*

- *All bicycle ergometers and treadmills connected to the system must meet IEC 60601-1 requirements.*
- *Liquids must not be allowed to enter the devices. If liquids have entered the devices, the ERS System must be checked by a service technician before being used again.*
- *Do not open any of the devices. There are no user-replaceable components inside the devices.*
- *Do not insert objects of any kind in any of the devices. They may touch live components and you might suffer an electric shock, cause fire, or damage the device.*

Warning

- *Patient Hazard — For stress-test examinations, a defibrillator and a pacemaker checked for proper functioning must be readily accessible at all times.*
- *Patient Hazard, Interpretation Hazard — A qualified physician must overread all computer-generated records.*
- *Patient Hazard — The operator must be trained in the use of the device.*
- *Patient Hazard, Equipment Damage — Do not modify the ERS System in any way.*
- *Risk of Poisoning — Observe all information provided by the manufacturers of chemical products required for the use and care of the devices. Always keep these chemical products in their original containers to avoid any confusion which may have severe consequences.*
- *RF Interference — Known RF sources, such as cell phones, radio or TV stations, and two-way radios, may cause unexpected or adverse operation of the ERS System. Check the performance before each use.*

Caution

- *Equipment Damage — Before connecting the device to the power line, check that the voltage and frequency ratings of your power line match the values indicated on the device nameplate.*
- *Equipment Damage — Make sure that viruses, malware, etc. do not infect your PC (check USB sticks for viruses before connecting them).*
- *Equipment Damage — Do not set up the PC or the ergometers in the direct vicinity of a window. Rain, humidity and sunlight may damage the equipment.*
- *Loss of Data — Back up the program directory and the database directory (as determined during installation) every day to avoid loss of data.*
- *Equipment Damage — Set up the PC in a location which affords sufficient ventilation. The ventilation openings must not be obstructed. The ambient conditions stated in the user manual must be ensured at all times.*
- *Equipment Configuration — The PC should not be used adjacent to, or stacked with, other equipment. If adjacent or stacked use is necessary, the equipment or system should be tested to verify normal operation in the configuration in which it is being used.*

1.7 SYSTEM REQUIREMENTS

Processor	Intel Pentium 4 2.6 GHz
RAM	512 MB
Hard drive	80 GB
Other drives	CD-ROM drive
Graphics card	1280 x 1024 pixels, 128 MB, 2 monitor outputs
Monitor(s)	1280 x 1024 pixels
Input devices	Keyboard, mouse

Interfaces	1 USB interface for connection of the dongle, 1 parallel or USB interface for connection of a printer, 1 to 16 serial interfaces for connection of the ergometers
Printer	ink jet or laser printer with parallel or USB connection
Miscellaneous	Sound card, speakers
Operating system	Windows 2000 Professional or Windows XP Professional

1.8 EQUIPMENT SYMBOLS

The symbols that you will find on the PC and on the ergometer are explained in the corresponding user manuals. Text labels explain the function of all symbols displayed on the screen.



Double-click the icon to start the program.

1.9 INTENDED USE

The ERS system automatically controls up to 16 ergometers (bicycles or treadmills) and offers individual training protocols. Each phase of the training protocol is documented, providing the therapist/physician with up to date information about the patient's status, performance data and training progress at any time.

The ergometers used must be medical ergometers that meet IEC 60601-1-1 requirements. Both bicycle ergometers and treadmills can be used.

ERS systems are only designed for operation in rooms used for medical purposes. It is intended for use in rehabilitation centers, cardiology offices and fitness centers with medical cardiac programs.

The ERS system is intended to be used only by trained operators under direct supervision of a licensed health care practitioner on adult and pediatric patients.

Parts and accessories must comply with the applicable safety standards of the IEC 60601 series and/or the system configuration must comply with the requirements of the standard IEC 60601-1-1 for medical electrical equipment.

1.10 THE ERS SYSTEM

INTRODUCTION

The role of exercise therapy as a part of the rehabilitation of cardiac patients in the follow-up treatment phase II is viewed positively to a large extent today, based on decades of favorable experience.

In recent years, various studies have been able to show the positive impact of exercise therapy on coronary patients (KELLERMANN et al., 1967; HELLERSTEIN, 1973; KÖNIG et al., 1977; HOLLMANN et al., 1983; ROST et al., 1991, among others).

Through constant advancement of new diagnostic and therapeutic methods, there has additionally been a fundamental transformation of the rehabilitation process of cardiology patients in the past few years. Along with the phases of early mobilization and exercise therapy, sports therapy has also taken on greater importance today. "Early mobilization" refers to passive and active mobilization as soon as the patient's clinical condition allows.

"Exercise therapy" is medically indicated and prescribed movement which is planned and regulated by the specialist therapist, monitored together with the physician, and performed with the patient alone or in a group.

"Sports therapy" is an exercise therapy measure which uses appropriate sports means to compensate for and regenerate disrupted physical, mental and social functions, prevent secondary injuries, and promote health-oriented behavior. It is based on laws of biology and includes, in particular, pedagogical, psychological and sociotherapeutic methods and aims to achieve lasting health literacy.

Ergometer training is used in this case, particularly in the areas of early mobilization and exercise therapy within the scope of inpatient and increasingly also in outpatient rehabilitation in order to increase the performance capacity of cardiovascular patients.

As studies have been able to show, the performance capacity and thus also the quality of life can be significantly improved even in patients with heart failure by selecting an appropriate form of training (interval training).

The increased requirements with regard to efficient work but also quality assurance and complete documentation ("efficiency monitoring") of the training performed with all registered data can, however, only be met by an appropriately designed ergometer training system.

The development of the new **ergoline rehabilitation system ERS** was able to draw on the experience of more than 250 installed ergoline rehabilitation systems. Through intensive collaboration with many users, therapists, sports scientists and physicians, a new, modular system for controlled ergometer training was developed which meets all of the requirements listed. The PC software assumes all of the patients' predefined training management, simultaneously documents all relevant data (e.g. ECG, heart rate, training data) and thus frees therapists from standard tasks – greater attention can be paid to the patients. But even in the case of the training equipment itself, the **ergoselect Reha** ergometer, the focus is on the patient. Options for modular expansion and upgrades allow the equipment to be adapted to increasing demands (e.g. automatic blood pressure measurement, options for adjusting the saddle, etc.).

AN OVERVIEW OF THE MOST IMPORTANT PERFORMANCE FEATURES OF THE SOFTWARE

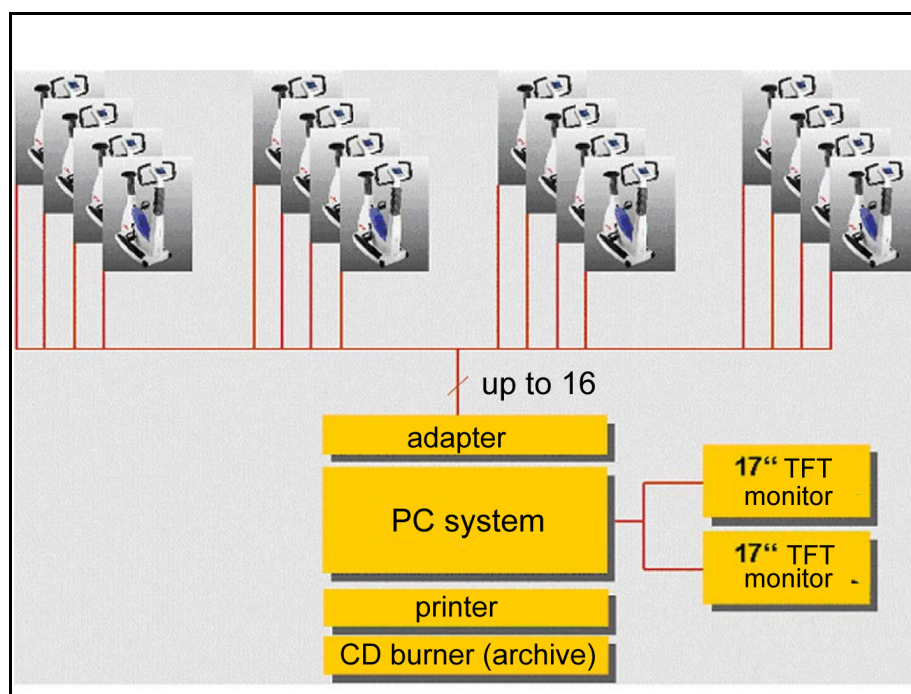
- Control of up to 16 ergometers or treadmills
- Clear display, intuitive operation
- Integrated patient and analysis database
- Admission of new patients possible even during a training session in progress
- The most important data of all patients are always visible
- Access at any time to all relevant additional information (even during a training session in progress)
 - Patient data, diagnosis, previous examinations
 - ECG trends
 - Training sessions stored earlier
 - Comparison with other training sessions of the same patient
- Acquisition of the patient's complete diagnosis allows optimal creation, monitoring and adaptation of the individual training protocols
- Comprehensive individual training protocols for each patient
 - Constant load

- Constant pulse (the software controls the ergometer load such that the patient's heart rate is constantly kept at a defined level)
 - Interval training
 - Universal warm-up and recovery phase definition
- The training parameters may be directly changed at any time by the therapist
 - Group training (all patients start at the same time)
 - Individual training (patients come when desired and train as long as desired)
 - Immediate printout of a patient's current ECG is possible at any time
 - Quality assurance:
 - Full documentation of the complete training session
 - Storage of all data recorded during the training session
 - Continuous ECG recording (the ECGs of all patients and all training sessions are stored)

SYSTEM CONFIGURATION

The central component of the ERS system is a PC with an MS Windows operating system and special software which runs the training programs. The training ergometers are connected to the PC system via control lines. All data are shown on 1 or 2 large TFT monitors; up to eight patients can be displayed and monitored on each monitor. The ergometers are equipped for ECG monitoring with single-channel ECG amplifiers, whose signals are transmitted to the PC via the serial interfaces. In addition, automatic blood pressure measurement can be integrated in the training protocols if the ergometers are equipped accordingly.

FIGURE 1.1:
SYSTEM CONFIGURATION



For your notes

2 STARTING THE PROGRAM, ADDING A PATIENT TO THE DATABASE

2.1 STARTING THE PROGRAM

- Start the program by double-clicking .

The initial screen will display.

The screen layout automatically adapts to the number of ergometers and to the system configuration. A maximum of eight patients can be displayed on one monitor. You will need a second monitor to view more than eight patients.

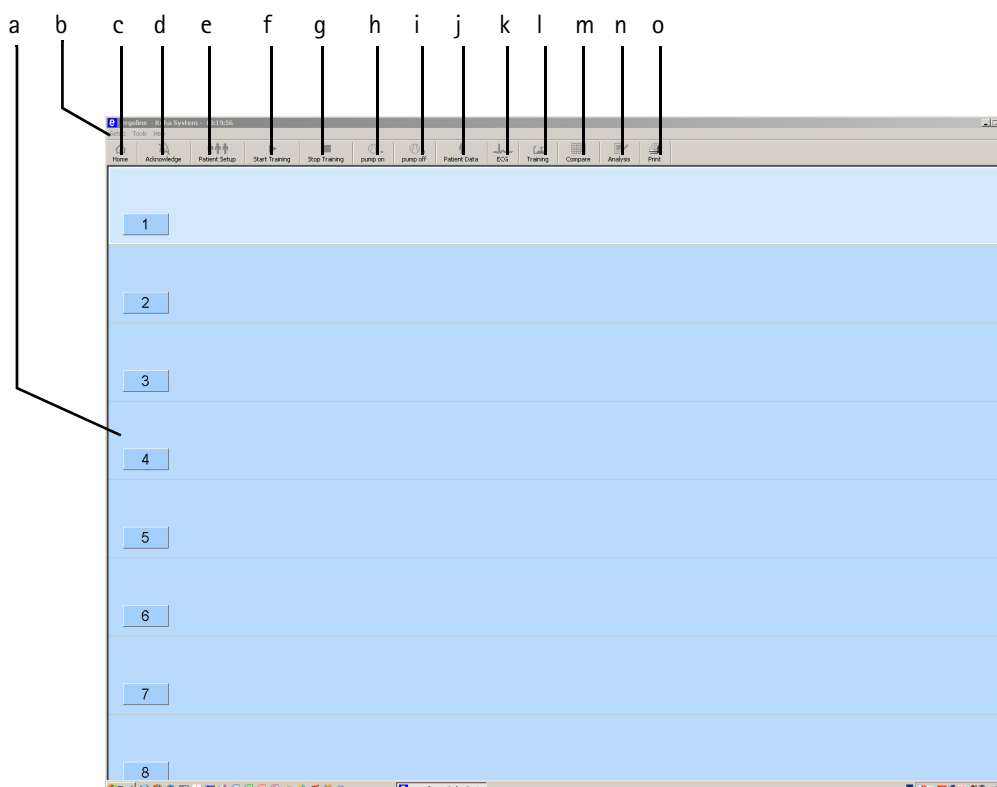


FIGURE 2.1: INITIAL SCREEN

- | | | | |
|---|--|---|--|
| a | Fields for patients 1 to 8 | i | Click to turn the electrode application system OFF for all ergometers |
| b | Click to display the setup menus <i>System</i> , <i>Service</i> and <i>Exit</i>
<i>Tools</i> : utilities for calculation/conversion of <i>METS</i> , <i>heart rate reserve</i> and <i>treadmill parameters</i>
<i>Help</i> : select to view the software version | j | Click to view or edit the data of the selected patient ("In-Test Operation" on page 36) |
| c | Click to display the initial screen | k | Click to view the stored ECG of the selected patient ("In-Test Operation" on page 36, "ECG" on page 45) |
| d | Click to suppress alarms for the alarm acknowledge time (see "Alarm acknowledge time" on page 47) | l | Click to view training data and trend of the selected patient |
| e | Click to display the patient setup (assign patient, admit new patients, see "Adding a Patient to the Database" on page 14, create protocols, see "Configuring Training Protocols" on page 19) | m | Click to compare the trends for different training sessions of the selected patient (see "In-Test Operation" on page 36) |
| f | Click to start session for all patients | n | Click to analyze the training of the selected patient |
| g | Click to stop session for all patients (with or without recovery phase) | o | Click to select and configure a printer (see "Printing" on page 43) |
| h | Click to turn the electrode application system ON for all | | |

2.2 ADDING A PATIENT TO THE DATABASE

- Click  and then **New Patient**.

Mandatory patient information is: *Last name, First name, Patient ID* (personalized or generated with Auto ID), *Date of birth*.

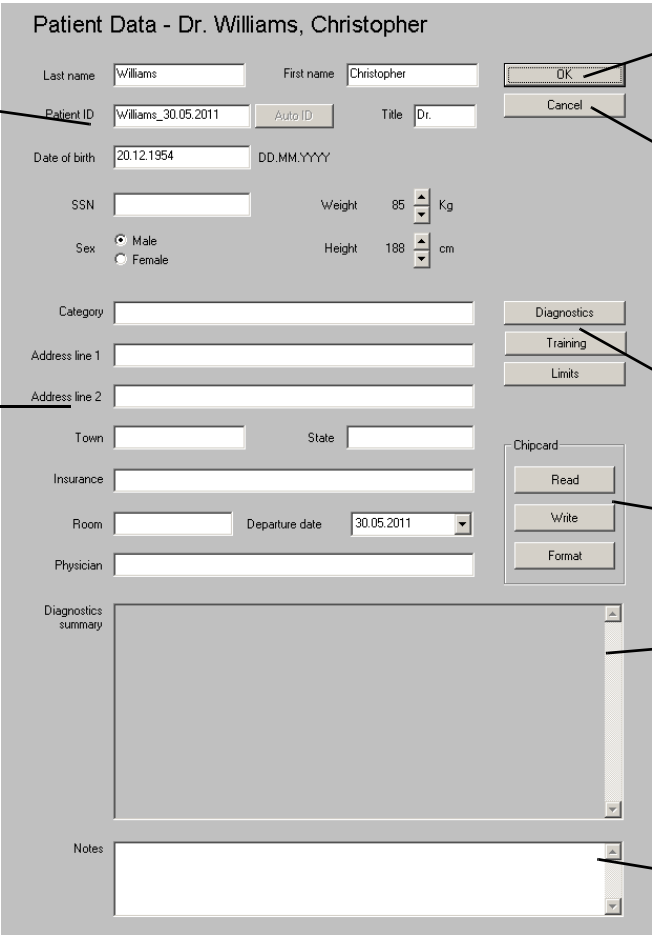
You can click the input boxes or navigate from box to box with the TAB key.

The points in the date of birth are inserted by the program. To enter 16 May 1956, type: 16051956.

Title, social security number (SSN), Sex, Height and Weight are voluntary data.

Click **OK** and the patient will be added to the database. The name will appear in the *Patient Setup* window (see Abbildung 2.3). Furthermore, the **Diagnostics**, **Training** and **Limits** buttons will be enabled (see "Configuring Training Protocols" on page 19).

Click **Cancel** to close the window without adding the patient to the database.



Patient Data - Dr. Williams, Christopher

Last name: Williams First name: Christopher

Patient ID: Williams_30.05.2011 Auto ID Title: Dr.

Date of birth: 20.12.1954 DD.MM.YYYY

SSN: Weight: 85 Kg

Sex: ☒ Male ☐ Female Height: 188 cm

Category:

Address line 1:

Address line 2:

Town: State:

Insurance:

Room: Departure date: 30.05.2011

Physician:

Diagnostics summary:

Notes:

Buttons: OK, Cancel, Diagnostics, Training, Limits, Read, Write, Format

Annotations:

- Input boxes for entry of patient data
- Click to add patient to database
- Click to close window without saving data
- Click to enter diagnostic data, configure protocols, define limit values
- Click to write patient data to chip card or download them from the chip card
- Patient diagnosis
- Input box for comments

FIGURE 2.2: PATIENT DATA WINDOW

WRITING PATIENT DATA TO CHIP CARD OR DOWNLOADING THEM FROM THE CHIP CARD

Ergometers of the ergoselect family allow patients to be automatically assigned to a specific ergometer. The data stored on the chip card are last name, first name, patient ID, date of birth, height, weight and sex.

Read: click button to read the chip card data

Write: click button to write data to the chip card

Format: click button to format the chip card if used for the first time.

PATIENT SETUP WINDOW

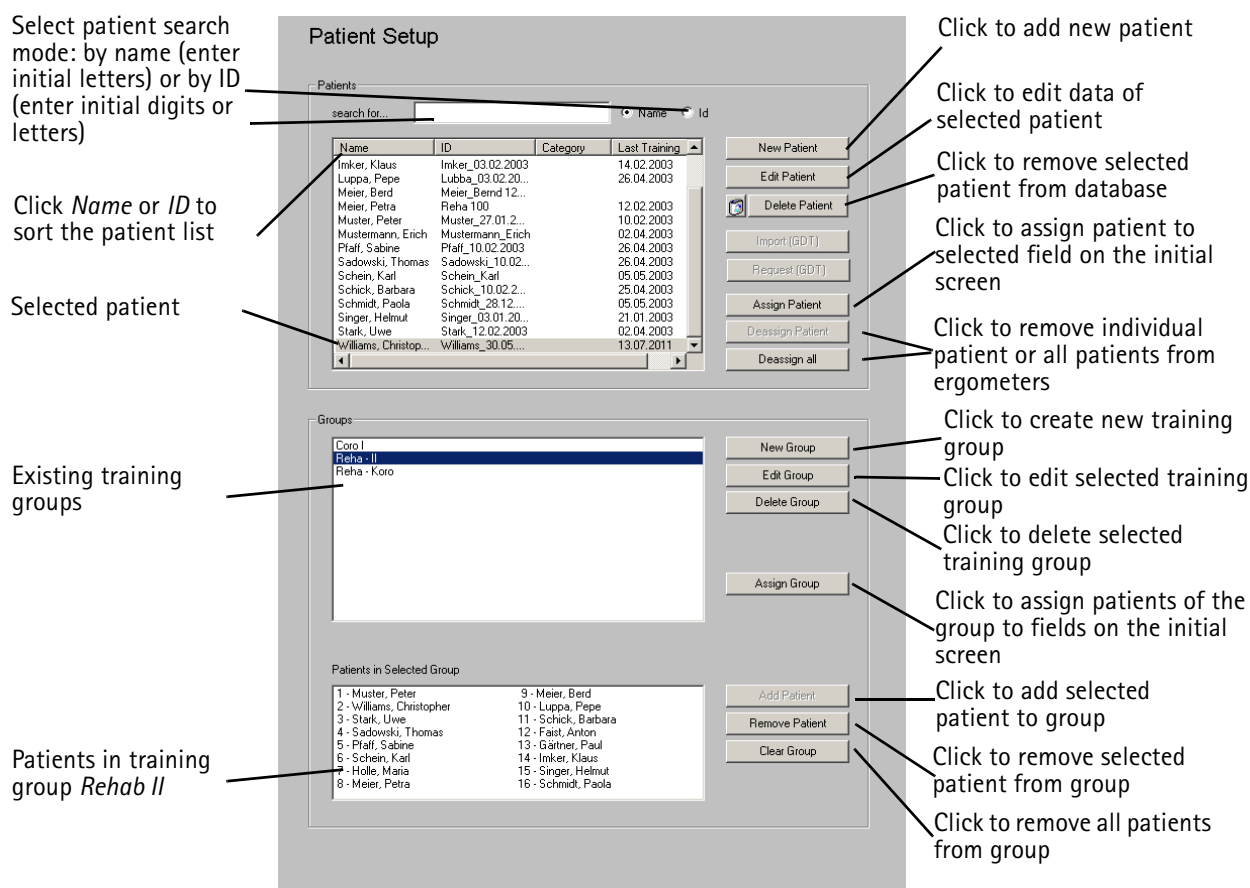


FIGURE 2.3: PATIENT SETUP WINDOW

For your notes

3 TRAINING PREPARATION

After adding a new patient to the database, you should proceed with configuring the training. *Diagnostics* is an option and can be added later on at any time.

You can enter or configure the diagnostic data and the training protocol either immediately after admitting a new patient or you can select the patient via *Patient Setup* and then click **Edit Patient** to open the *Patient Data* window (Figure 3.2).

3.1 DIAGNOSTIC DATA (OPTION)

- In the *Patient Data* window click **Diagnostics** to open the input window.

To allow therapists to configure the optimal training protocol and correctly assess the training results, it is essential for them to be aware of the patient's medical history and diagnostic data.

In addition to pre-existing conditions and prescribed medications, the results of exercise test ECGs and ultrasound studies can be entered.

After the window has been closed with **OK**, a diagnostic summary will appear on the *Patient Data* screen (see Figure 3.2).

Should complications occur during the training, the therapist has immediate access to all relevant information, for example, by double-clicking the patient's name.

Diagnostics - Dr. Williams, Christopher

Diagnosis

KHK: ☐ GE, ☐ Alt. Cardiac arrest, ☐ VwI, ☐ HWI, ☐ Angina pectoris, ☐ Hypertonie, ☐ NYHA

Rhythmic Interference: ☐ Rhythmic interference, ☐ V Arrhythmias, ☐ SV Arrhythmias, ☐ VHF, ☐ AV block II*, ☐ SM-Implant., ☐ ICD

Status After: ☐ Replacement of mitral valve, ☐ Replacement of aortal valve, ☐ IMA, ☐ PCI, ☐ PCI + Stent, ☐ ACB, ☐ ICD

Cardiomyopathy: ☐ DCM, ☐ ICM, ☐ HCM, ☐ HOCM, ☐ RCM, ☐ Cardiomypopathy due to hypertension

Others: ☐ Cardiac insufficiency, ☐ Diabetes Mellitus, ☐ AVK, ☐ COPD, ☐ BAA, ☐ Aneurysma, ☐ Ortho.

Medication

☐ Beta blocker, ☐ ACE inhibitor, ☐ Nitrates, ☐ Coumarine derivative, ☐ Digitalis, ☐ Anti-lipid meds, ☐ Diuretic, ☐ Calcium antagonist, ☐ Anti-arrhythmic, ☐ Anti-coagulant, ☐ Anti-diabetic, ☐ Anti-hypertensive

Additional Tests

☐ Echocardiogram

EF: 50, PE: 0 mm, PLE: 0 mm, Vmax: LV0, LV1, LV2, LV3

☐ Stress test

Interrupted due to: ☐ With beta blocker, ☐ AP, ☐ Muscular exhaustion, ☐ Dyspnea, ☐ Irregular rhythm, ☐ ST depression, ☐ Limited

HR Rest: 50 (1/min), HR Max: 100 (1/min), Load Max: 100 (W)

Systolic BP max: 120 mmHg, Diastolic BP max: 80 mmHg

Diagnosis pane

Medication pane

Additional Tests pane

Click to close window without saving the data

Click to close window, saving the data

FIGURE 3.1: *DIAGNOSTICS* WINDOW

Patient Data - Dr. Williams, Christopher

Last name: Williams First name: Christopher OK Cancel

Patient ID: Williams_30.05.2011 Auto ID Title: Dr.

Date of birth: 20.12.1954 DD.MM.YYYY

SSN: Weight: 85 Kg

Sex: ☒ Male ☐ Female Height: 188 cm

Category: Diagnostics Training Limits

Address line 1: Address line 2: Town: State: Insurance: Room: Departure date: 30.05.2011 Chipcard: Read Write Format

Physician:

Diagnostics summary

Diagnosis :
 KHK : GE 1
 Rhythmic interference : Rhythmic interference
 Others : Diabetes Mellitus
 Medication : Beta blocker
 Stress test : With beta blocker
 HR Rest = 50 [1/min], HR Max = 100 [1/min]
 Systolic BP max = 120 mmHg, Diastolic BP max = 80 mmHg
 Load Max = 100 [w]
 Interrupted due to : Muscular exhaustion

Area for input of additional data or information

Notes:

FIGURE 3.2: PATIENT DATA WINDOW WITH DIAGNOSTICS SUMMARY

3.2 CONFIGURING TRAINING PROTOCOLS

Specific training protocols can be configured and saved for each patient.

- In the *Patient Data* window click **Training** to open the input window.

Training - Dr. Williams, Christopher

Load scale (W) | **Pulse rate scale** (1/min) | **Blood pressure scale** (mmHg)

Time the blood pressure is taken

Click to close window and save training protocol (OK)

Click to close window without saving the data (Cancel)

Click to print training protocol (Print)

Click to enter comments (during session only) (training notes)

Select check box to transmit the ECG, or clear check box (see page 27) (ECG)

Click to configure treadmill protocols (see "Configuration of Treadmill Protocols" on page 28) (Treadmill)

BP measurement options

Training type options

Configuration of warmup phase 1

Configuration of warmup phase 2

Configuration of training phase

Configuration of recovery phase

FIGURE 3.3: TRAINING CONFIGURATION WINDOW

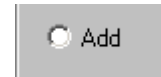
BLOOD PRESSURE MEASUREMENT

If ergometers with BP measurement systems are used, the blood pressure can be measured automatically at fixed intervals (for example, every 4 minutes) or the time for a measurement can be set individually.

To enable automatic BP measurements, select the *Measure BP every* check box and determine the interval (e.g., 4 minutes) with the arrow buttons.



To determine specific times for a measurement, select *Add*, position the mouse cursor on the graph and left-click the point on the time scale where a measurement is to occur.



To remove individual measurement points, select *Remove*, then click the measurement point.



Note

- Furthermore, you can enter BP values measured off line (see "Operation via popup menu" on page 38).
- For information about editing and deleting incorrect BP values, please refer to "Editing/Deleting BP Values" on page 42.

TRAINING TYPE

For the training phase, you can choose from three different training types:

- Constant HR
- Constant load
- Interval training.

Each of the training types will be explained below. For instructions concerning the configuration of the training phase for the different training types, please refer to "Configuration of Training Phase" on page 23.

CONSTANT HR

The ergometer automatically adapts the load to keep the patient's pulse rate constantly at the target value during the training phase. If the pulse exceeds the target value, the load will be gradually reduced. If the pulse drops, the load will be increased. Furthermore, an upper limit for the load can be specified, e.g. 70 watts.

Note

- *When the patient reaches the target pulse rate for the first time, the load will immediately be reduced by 15 % to allow the pulse to achieve the steady state. Without the load reduction, the training pulse would lag behind for 1 to 2 minutes and the load would be dramatically reduced.*
- *The percentage value can be modified by a service engineer.*

CONSTANT LOAD

The load will be maintained at the defined value. It will not be adapted to the pulse rate. The current load can easily be changed during the training at any time. The training load is the actual load attained during the training phase. The training pulse is an approximate value and is given for information purposes only. This means the patient will exercise with the set load in watts, irrespective of the pulse rate.

As an alternative, the load can be controlled via the SpO₂ value (see "SpO₂-controlled Training" on page 24).

Note

- **Different load values for constant HR and constant load protocols**
The defined load for a constant HR training ("maximum load") and a constant load training ("training load") are two different parameters. They are not identical. If a constant HR protocol is configured, the defined load applies only to this training type. The same is true for a constant load training.
For a constant HR training, for example, you can define a "maximum load" of 70 W and for a constant load training a "training load" of 90 W. Always check both settings if you intend to switch between the two training types.
- **Switching between training types during the session**
If you switch between constant HR and constant load in the course of a session, the current load will remain effective.

INTERVAL TRAINING

Interval training has become an established, ideal training type for patients with heart failure or weak muscles. In interval training protocols, work and recovery phases alternate in a fixed rhythm (e.g., 20 seconds at 80 watts followed by 40 seconds at 16 watts, etc.).

CONFIGURATION OF WARMUP PHASES 1 AND 2

Two warmup phases precede the actual training phase.

For *Warmup Phase 1*, you set a constant load for a specific period of time.

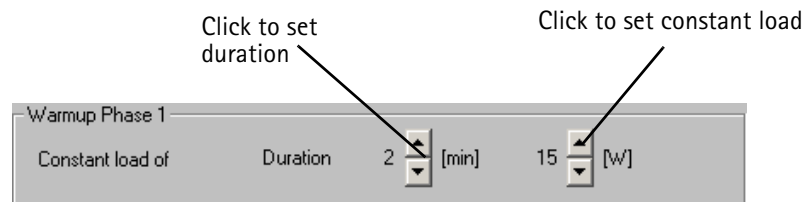


FIGURE 3.4: *WARMUP PHASE 1* CONFIGURATION WINDOW

During *Warmup Phase 2*, the load adapts automatically in a linear fashion. The load increments depend on the set duration, but will never exceed 25 W/min.

You can choose between a constant load increase per minute or a constant HR increase per minute.

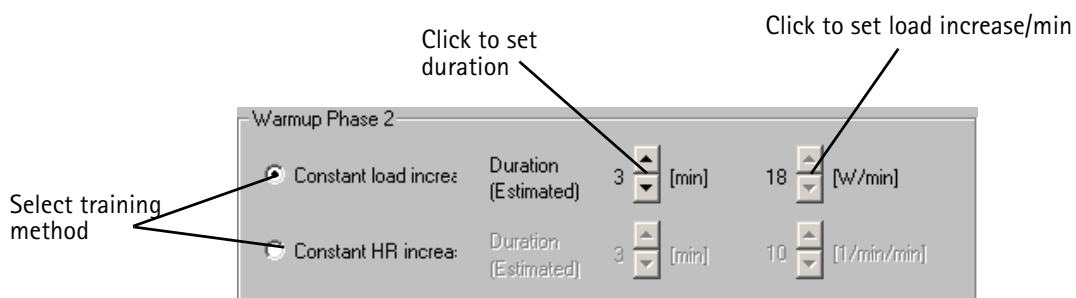


FIGURE 3.5: *WARMUP PHASE 2* CONFIGURATION WINDOW

CONFIGURATION OF TRAINING PHASE

CONSTANT HR

For constant heart rate training phases, you determine:

- duration
- maximum load
- training pulse

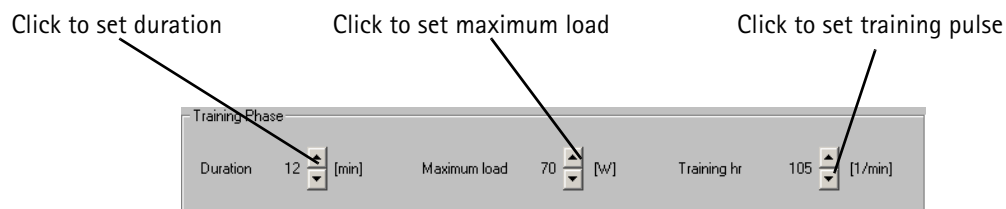


FIGURE 3.6: *TRAINING PHASE CONFIGURATION WINDOW (CONSTANT HR)*



FIGURE 3.7: *SET HEART RATE FOR EXERCISE (TRAINING) PHASE*

Figure 3.8 shows a constant HR training phase. In the beginning, the load is increased until the target training pulse is reached for the first time. Then the load is reduced by 15 % and is maintained at a level where the pulse rate remains more or less constant.



FIGURE 3.8: *CONSTANT HR TRAINING*

CONSTANT LOAD

For constant load training phases, you determine:

- duration
- training load
- training HR (target heart rate).

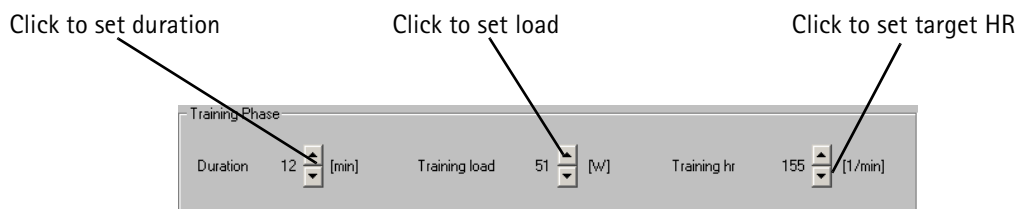


FIGURE 3.9: TRAINING PHASE CONFIGURATION WINDOW (CONSTANT LOAD)

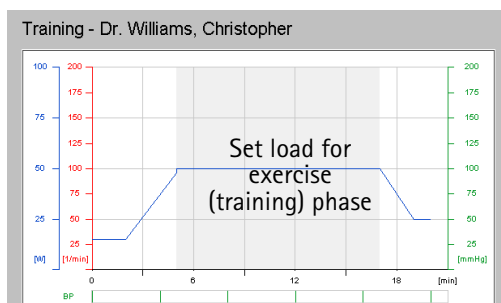


FIGURE 3.10: SET LOAD FOR EXERCISE (TRAINING) PHASE

SpO₂-controlled Training

- Open the configuration window with SpO₂.
- Select the settings and click OK to close the window.

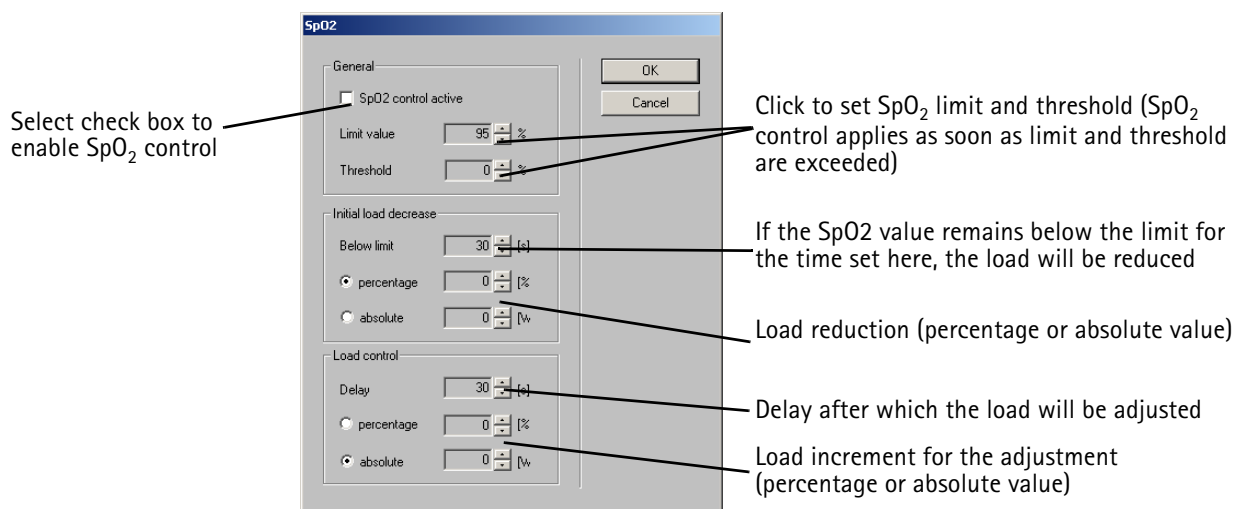


FIGURE 3.11: SpO₂ CONFIGURATION WINDOW

INTERVAL TRAINING

For interval trainings, you can either choose a profile from a number of stored profiles or configure your own training profile.

Follow these steps to select one of the stored profiles:

- Open the drop-down menu with .
- Select the profile.
- Enter the target heart rate (for information purposes only, it will not affect the load regulation).
- Close the *Training* window by clicking **OK**.

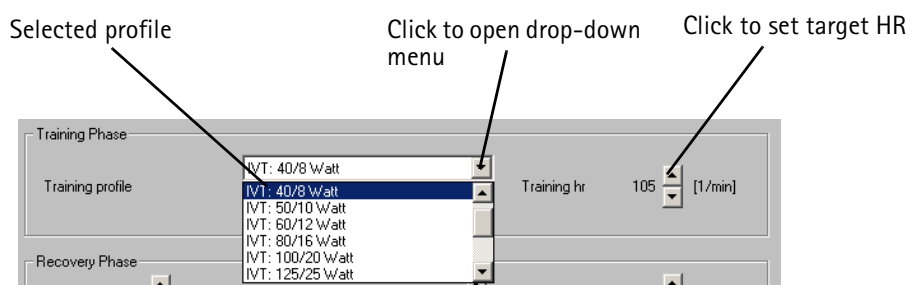


FIGURE 3.12: INTERVAL TRAINING, SELECTING A PREDEFINED PROFILE

Configuring an interval training protocol

- Click **Define training profile** to open the configuration window.

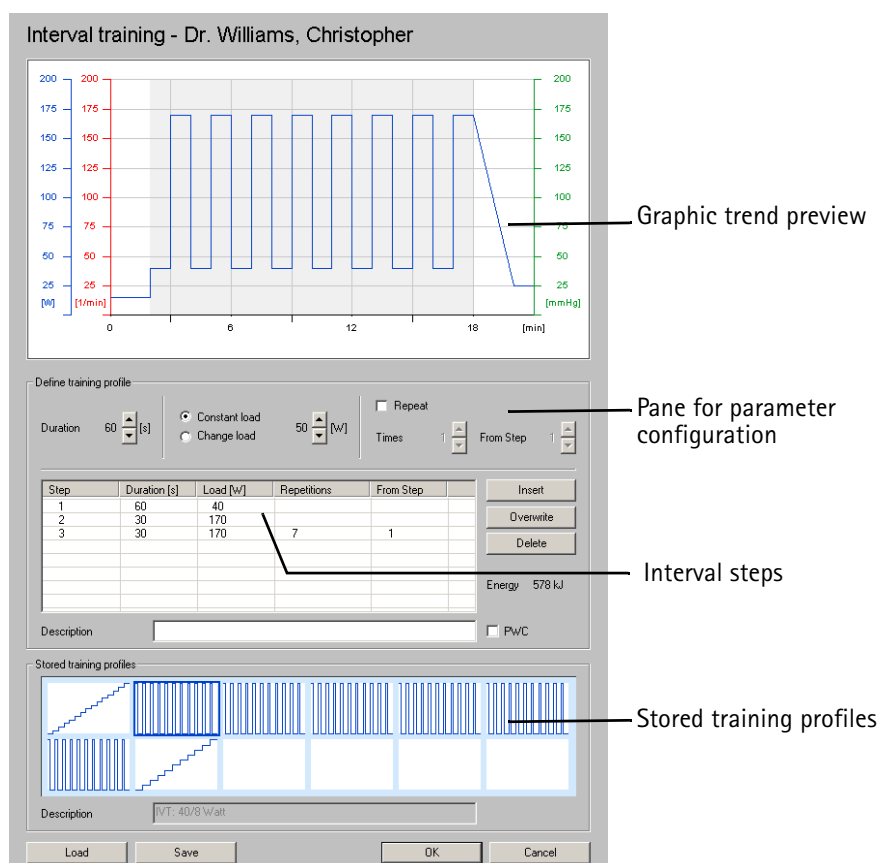


FIGURE 3.13: CONFIGURING AN INTERVAL TRAINING PROTOCOL

- At *Duration*, enter the length of the interval in 10-s increments.
- Select the *Constant load* option and set a load for the training period selected at *Duration*.
- Select the *Change load* option and set a load increment by which the preceding load will be changed for the training period selected at *Duration*.
- Select the *Repeat* check box and set the number of repetitions and the step from which the repetitions are to be performed.
- Click **Insert** to add a new row with an interval configured as described above. If a row in the table is highlighted, the new row will be inserted above that row. With **Overwrite/Delete** a table row can be overwritten or deleted.

Saving training profiles

After configuration of a profile, the new profile can be saved and is then available for other patients:

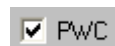
- At *Description*, enter a name for the profile.
- Click in one of the 12 fields where you would like to save the profile.
- Save the profile with **Save**.

Loading training profiles

- Click **Define training profile** to open the selection window.
- Click in the field with the profile you want to use.
- Click **Load** and confirm the prompt with **Yes**.

PWC Value

The PWC value can be calculated only when the interval profile was configured as a graded profile. Select the *PWC* check box to calculate the value.



CONFIGURATION OF THE RECOVERY PHASE

After the end of the defined training phase, the *Recovery phase* will start. The load will drop to a set value within a given period of time and be held constant for a defined period.

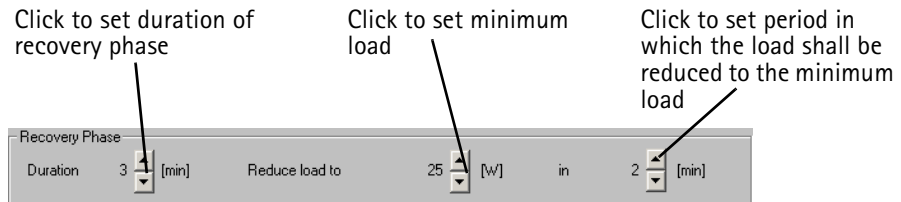


FIGURE 3.14: *RECOVERY PHASE CONFIGURATION*

ENABLING/DISABLING ECG DISPLAY

Disabling display of the ECG makes sense only if the patient wears a chest belt or if no ECG electrodes are used. This helps prevent artifacts on the ECG waveform due to unused patient cables. Furthermore, it helps avoid display of an incorrect ECG or incorrect HR values in the summary graph.

Show ECG: ☒ ecg

Do not show ECG: ☐ ecg

If the ECG is disabled, the ergometer will not transmit ECG signals to the ERS program. In this case, the HR can be determined by means of a chest belt and receiver.



FIGURE 3.15: *ECG DISABLED*

CONFIGURATION OF TREADMILL PROTOCOLS

Training protocols for treadmills are essentially configured in the same way as for bicycle ergometers. In addition, however, the elevation can be specified for each training phase in the *Treadmill* window. During the training, loads specified as *Elevation* will be converted to speed. The calculated speed will then be displayed.

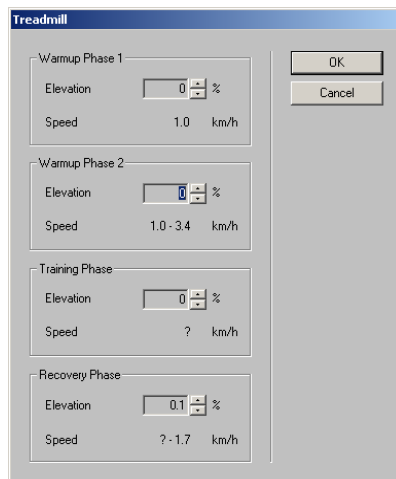
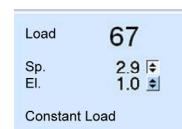


FIGURE 3.16: *TREADMILL* CONFIGURATION WINDOW

During the training, the *Home* view can be accessed to change speed or elevation in the exercise phase. Any changes will affect the set load.



In the "constant HR" training mode, only the elevation can be changed during the training. The corresponding speed will be displayed during the training.



3.3 ALARM LIMITS (OPTION)

Alarm limits can be set for each individual patient. The system will emit visual and audible alarms upon violation of these limits.

- In the *Patient Data* window, click **Limits** to open the input window.

Enable the alarm limit, e.g., the *Upper HR limit*. ☒ Upper HR limit

- Use the arrow buttons to set the heart rate limit.
- Set the remaining alarm limits in the same way.
- Close the window by clicking **OK**. This will save the alarm limits for the selected patient.

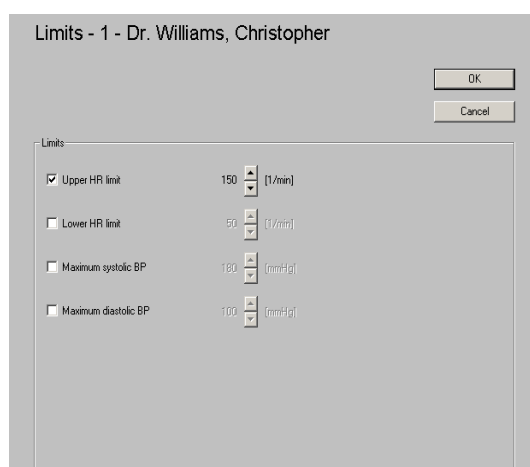


FIGURE 3.17: *LIMITS CONFIGURATION WINDOW*

For your notes

4 RUNNING A TRAINING SESSION

Note

- Patient preparation measures (general preparation for bicycle ergometer training, application of ECG electrodes and blood pressure cuffs) are described in the user manual of the bicycle ergometer.
- The ergometer should be switched on before the patient sits down.

4.1 ASSIGNING PATIENTS TO ERGOMETERS

Patients can be assigned to ergometers individually, as a training group or automatically by means of the chip card.

ASSIGNING AN INDIVIDUAL PATIENT

- Click  to display the patient setup screen.
- At 1, select the ergometer position, e.g. "2".
- Select the patient 2.
- Confirm with Assign Patient 3.

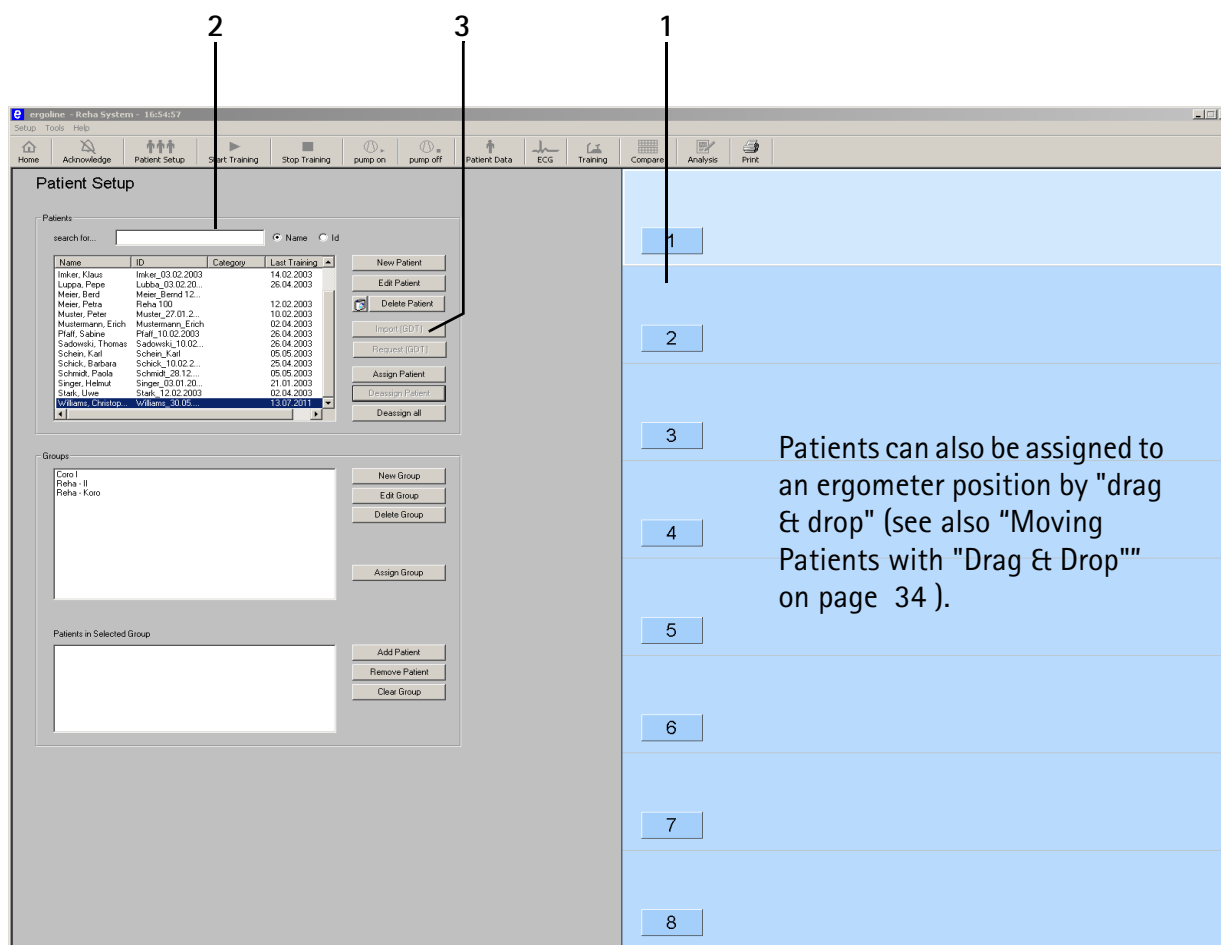
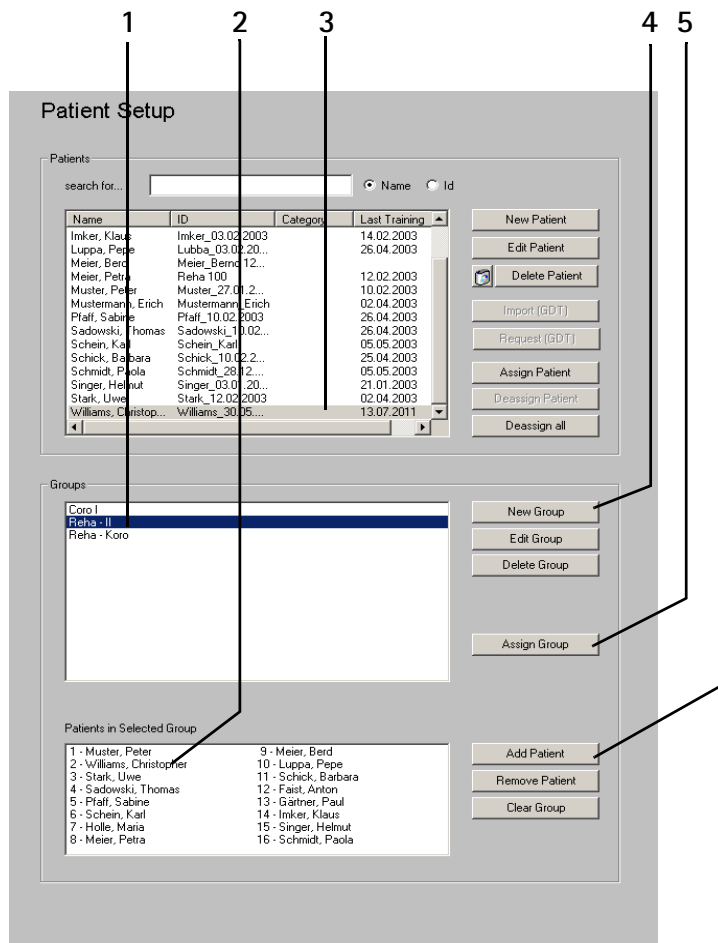


FIGURE 4.1: ASSIGNING PATIENTS

ASSIGNING TRAINING GROUPS

CREATING A TRAINING GROUP

- Click New Group 4.
- Enter a group name (such as Rehab III) and confirm with OK: The group name will appear in the *Groups* window 1.
- Click the group name 1: The *Patients in Selected Group* window displays positions 1 to 16 2.
- Select the position 2.
- Select the patient 3 and confirm with Add Patient 6.



Groups can also be created by "drag & drop": drag patients from patient list to the group list (see also "Moving Patients with "Drag & Drop"" on page 34).

FIGURE 4.2: CREATING A TRAINING GROUP

ASSIGNING TRAINING GROUPS

- Select a group, such as Rehab III 1.
- Click Assign Group 5.

With Edit Group you can edit the group name.

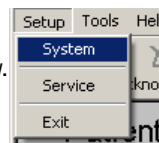
With Delete Group you can delete the entire group.

With Clear Group you can remove all patients from the group.

ASSIGNMENT WITH CHIP CARD

With ergoselect bicycle ergometers, patients can be assigned automatically by inserting the chip card in the ergometer and they can be removed by removal of the chip card.

- Click *Setup* -> *System* to open the *Setup System* window.



- Select the *Assign and deassign patients automatically* check box.
- Confirm with **OK**.

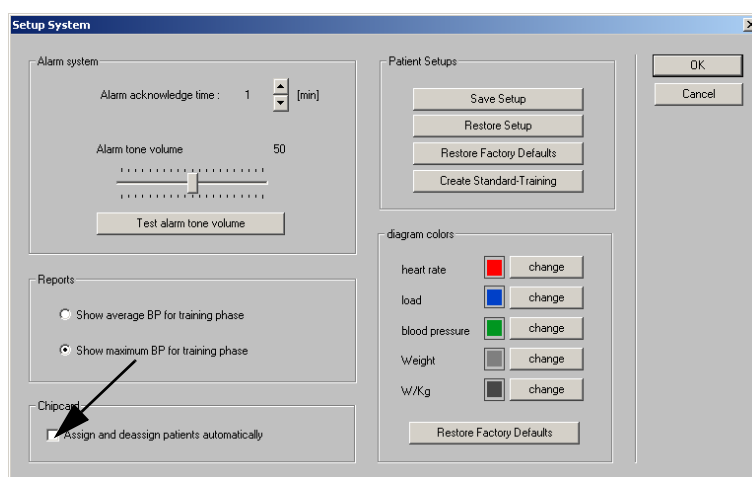


FIGURE 4.3: SETUP SYSTEM

ASSIGN/REMOVE VIA POPUP MENU

- Right-click the field of the ergometer in question.
- Select *Assign Patient*.
- Select the patient and confirm with **OK**.

Follow the same procedure to remove a patient.

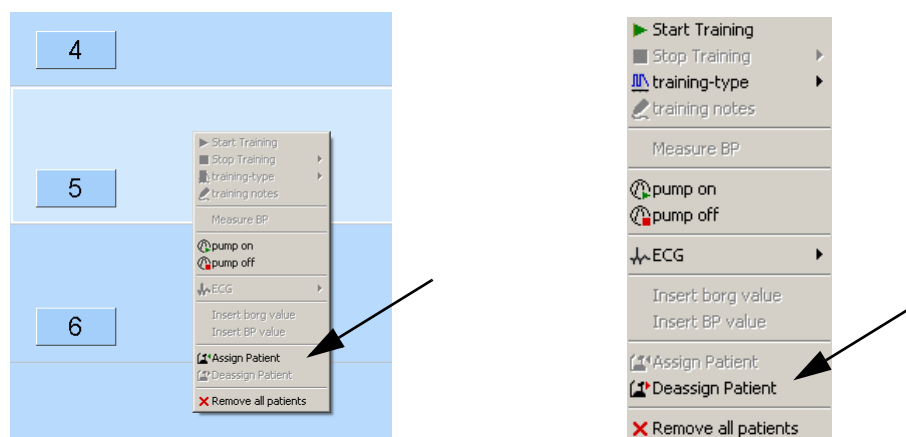


FIGURE 4.4: POPUP MENU

MOVING PATIENTS WITH "DRAG & DROP"

Using the "Drag & Drop" function, you can easily move patients between ergometers:

- With the left mouse button, click the patient name and hold the button pressed.
- Drag the name to the number of the new ergometer and release the mouse button.

The patient has now changed places. If a patient had been assigned to the new ergometer, the two patients will swap places.

4.2 STARTING TRAINING SESSIONS

Note

- *Patient preparation measures (general preparation for bicycle ergometer training, application of ECG electrodes and blood pressure cuffs) are described in the user manual of the bicycle ergometer.*
- *The ergometer should be switched on before the patient sits down.*

As soon as the patients sit on the ergometers, you can start the training.

- Click  and answer the query *Start training for all patients* with Yes.

The training will start with warmup phase "WP1" for all patients.

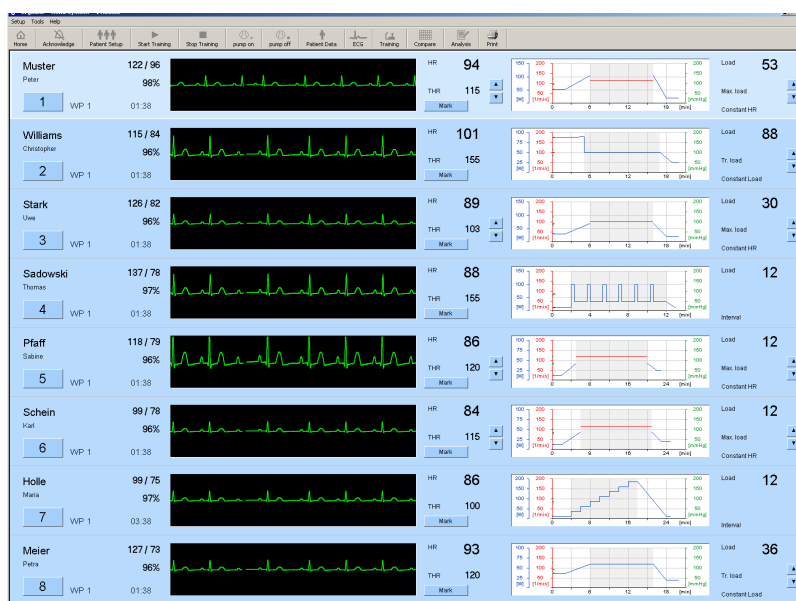


FIGURE 4.5: INITIAL SCREEN OF TRAINING SESSION

It is also possible to start individual training session, e.g., when a patient is late.

- Assign the patient.
- Right-click the corresponding field.
- Start the training session from the popup menu (see "Operation via popup menu" on page 38) with *Start Training*.

4.3 DATA IN PATIENT FIELD

The patient field provides a clear presentation of the patient data. All changes, even those necessary during the training session, can be performed in this field.

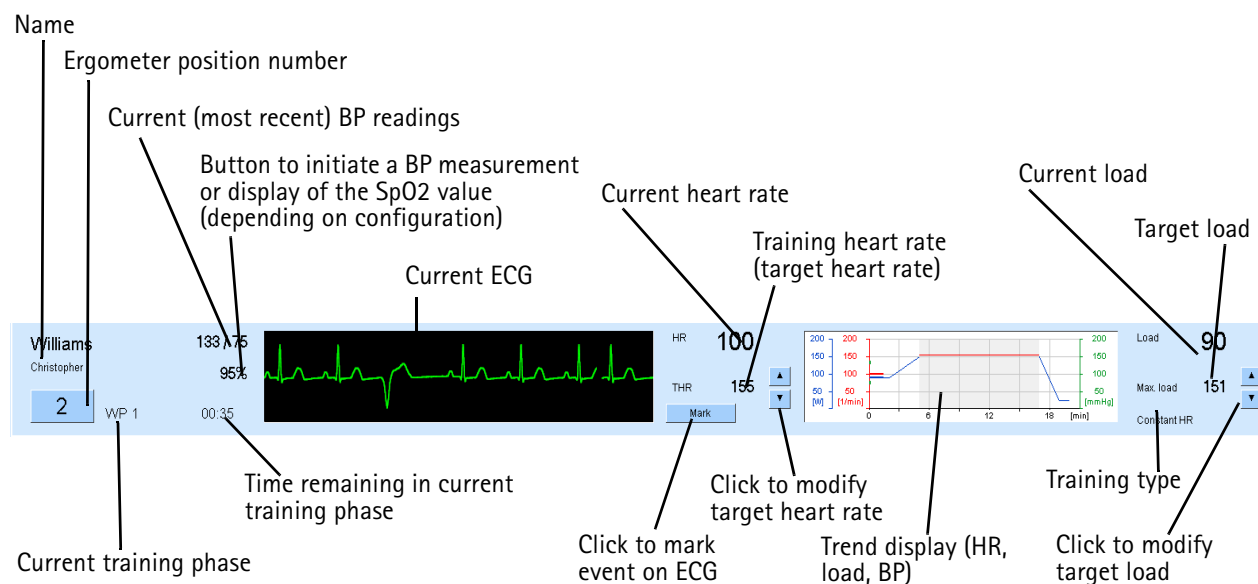


FIGURE 4.6: PATIENT FIELD

DATA FOR TREADMILL TRAINING

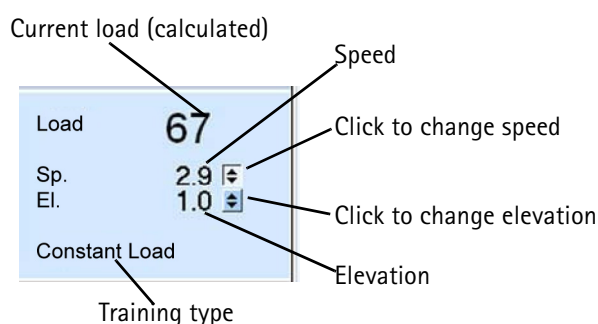


FIGURE 4.7: DATA FOR TREADMILL TRAINING

Note

- Changes made in the patient field apply only to the training phase, not to the warmup phases.

ABBREVIATIONS USED

WP 1	warmup phase 1	HR	heart rate
WP 2	warmup phase 2	THR	training heart rate
TP	training phase	Sp.	speed (treadmill)
RP	recovery phase 2	El.	elevation (treadmill)

4.4 IN-TEST OPERATION

During the test, operation can be performed via operating controls or from the popup menu.

SOFTKEY OPERATION



FIGURE 4.8: OPERATING CONTROLS

Start Training	Click to start session for all patients
Stop Training	Click to stop session for all patients (either with or without recovery phase)
pump on	Click to turn the electrode application system on for all ergometers (ergometers with "pump" option only)
pump off	Click to turn the electrode application system off for all ergometers
Patient Data	Click to view the data of the selected patient (verify, edit)
ECG	Click to view the stored ECG of the selected patient. This button allows you to retrieve past ECG segments. Furthermore, it is possible to switch between markers inserted by the therapist and view the corresponding ECG segment.

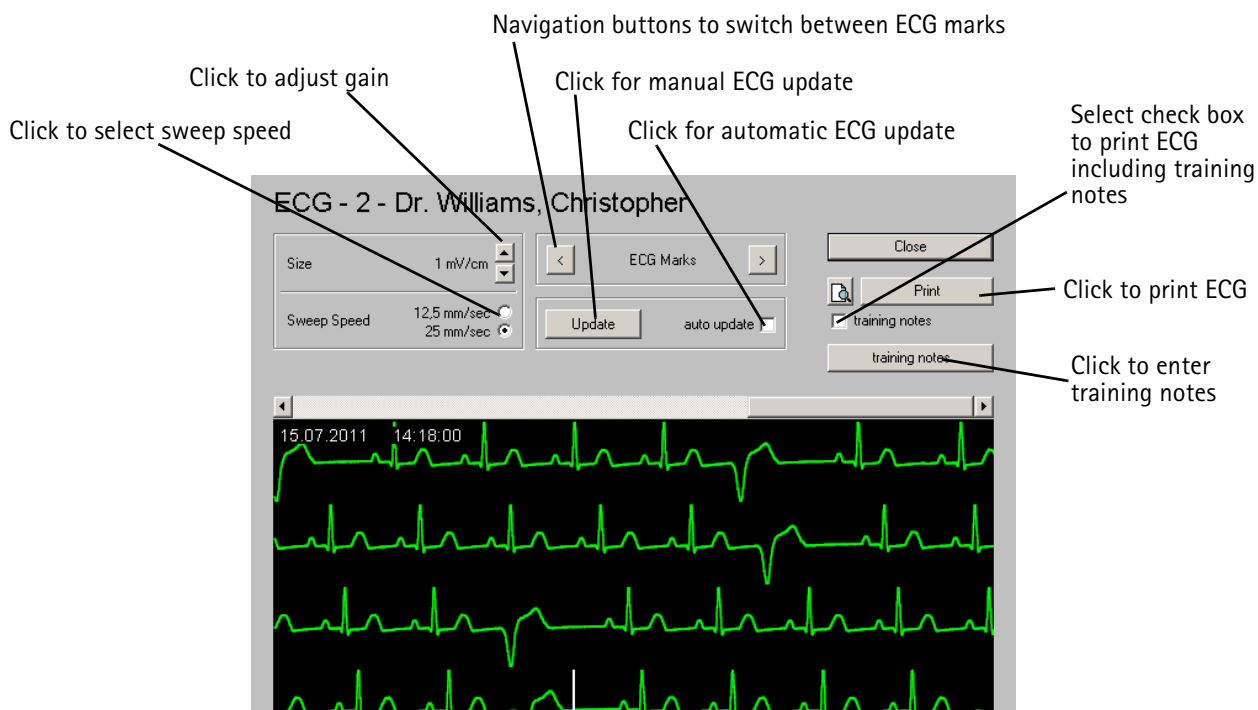


FIGURE 4.1: ECG DISPLAY DURING TRAINING SESSION

Training

Click to view training data and trend of the selected patient. With this function, the training protocol can be modified during the session or the training can be aborted. It is also possible to change between constant heart rate and constant load modes, for example, when arrhythmias make it impossible to calculate the correct heart rate or when the ECG lead quality deteriorates.

Compare

Click to compare the trends for different training sessions of the selected patient.

The full graphic trend as well as the most important values in tabular form can be viewed.

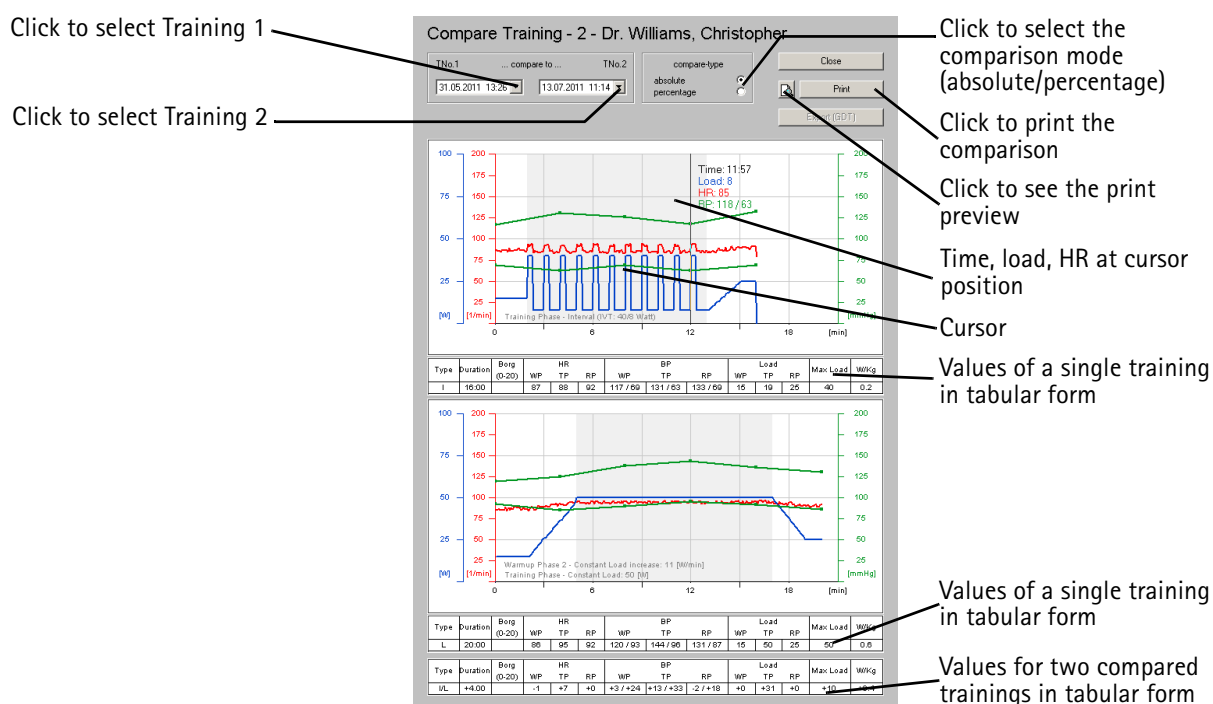


FIGURE 4.9: COMPARE TRAINING SCREEN

OPERATION VIA POPUP MENU

A number of functions can be controlled from a popup menu. In addition to the functions that can be controlled with the softkeys (such as *Stop Training*, change *Training Tye*) you can:

- enter BP values measured off-line
- enter a Borg value.

Click the patient field with the right mouse button to open the popup menu.

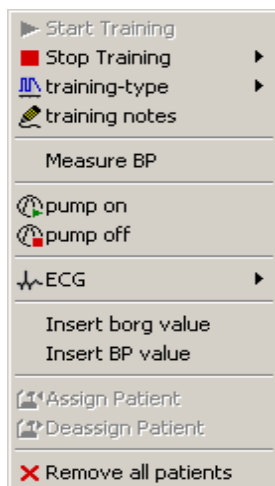


FIGURE 4.10: POPUP MENU

Entering BP values measured off-line

- Open the popup menu.
- Click *Insert BP value*.
- Type the systolic and diastolic BP values in the input window.
- Confirm with **OK**.

Immediately after input, the values appear in the graphics window. Depending on the training phase in which you enter values, they will also be used for analysis and for the summary graph.

Note

- For information about editing and deleting incorrect BP values, please refer to "Editing/Deleting BP Values" on page 42.

Entering the Borg Rating

The Borg rating identifies the patient's perceived exertion on a scale from 0 to 20 where the minimum value corresponds to the minimum perceived training intensity and the maximum value corresponds to the maximum exertion.

- Open the popup menu.
- Click *Insert Borg value*.
- Enter the value and confirm with **OK**.

5 ANALYZING TRAININGSESSIONS

5.1 INDIVIDUAL TRAINING AND SUMMARY

The *Analysis* function  offers a number of options for analyzing individual training sessions and for highlighting the patients' progressively improving performance.

With *Analysis*, you display the selected patient's last training session. In addition to a graphic diagram and the ECG of the last session, a table lists all the patient's training sessions. You can click in a row of the table to view the corresponding graphic diagram and ECG.

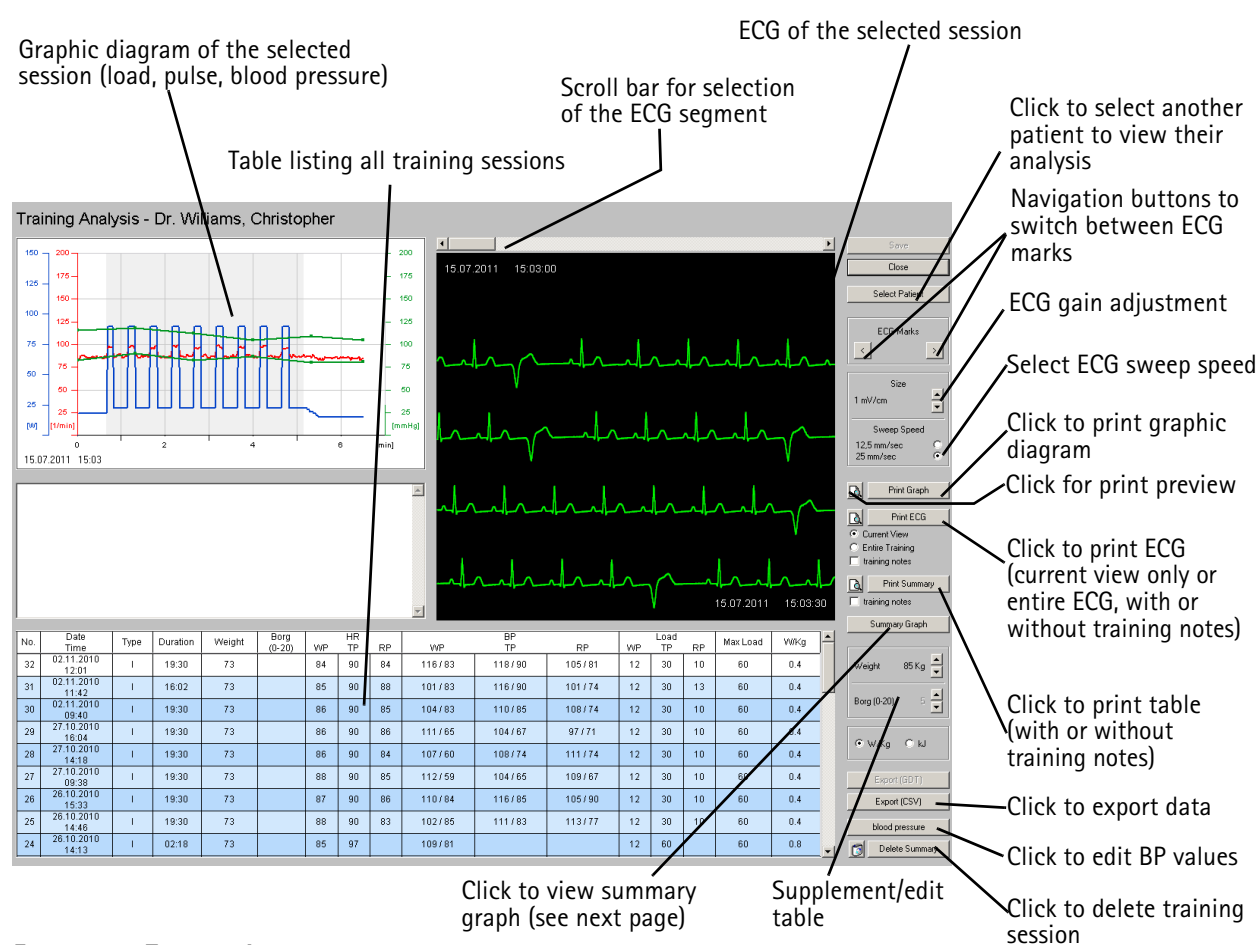


FIGURE 5.1: TRAINING ANALYSIS

5.2 SUMMARY GRAPH (TREND)

To view the summary graph, click **Summary Graph** on the *Training Analysis* screen (Figure 5.1).

The summary graph provides trend information about the following parameters for a selectable period of time:

- load
- heart rate
- blood pressure
- weight
- W/kg (power output per kg of body weight).

The following settings are possible:

The training period is adjusted by means of the boxes *from* and *to*.

Timeframe

from 31.05.2011 13:26:45 (Nr. 1)

to 15.07.2011 15:03:14 (Nr. 12)

The parameters to view can be selected, as can the phase (warmup, training or recovery phase) for which the parameters shall be displayed.

load

☒ show

☐ Warmup Phase

☒ Training Phase

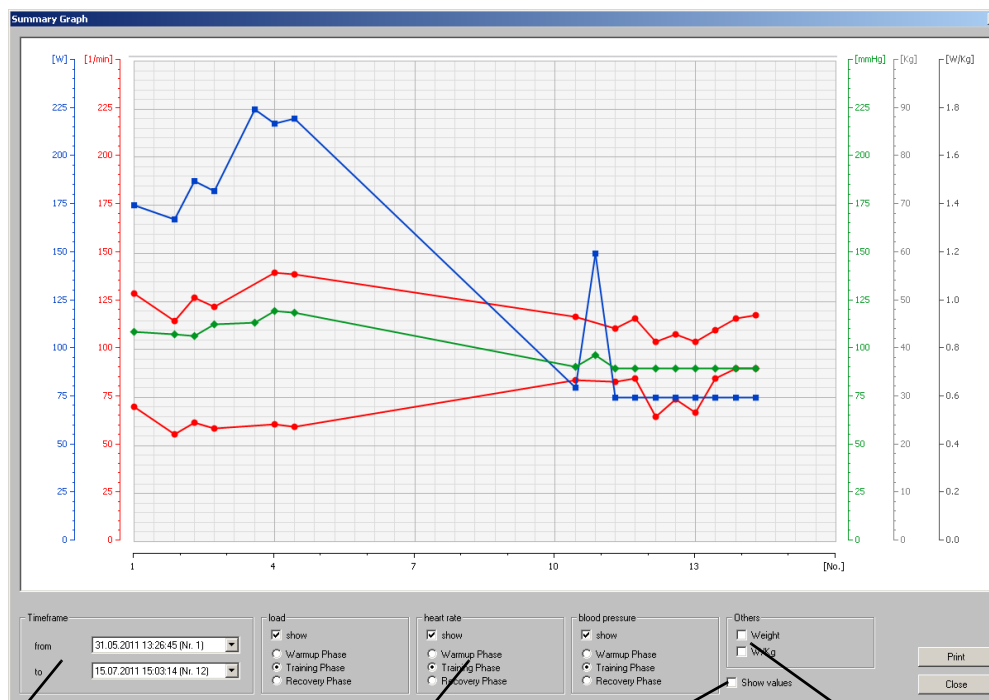
☐ Recovery Phase

Furthermore, the trend data for *weight* and *W/kg* (power output per kg of body weight) can be selected.

Others

☐ Weight

☐ W/Kg



Select training period

Select parameters and phase

Select to show measuring values

Select to view weight and W/kg

FIGURE 5.2: SUMMARY GRAPH

Note

- For load and heart rate, the mean values in each phase will be displayed.
- For blood pressure (systolic/diastolic), either average or maximum BP values will be shown depending on the selected configuration (see "Average/maximum BP values" on page 48).

If you select the *Show values* check box, the corresponding measuring values will be displayed.

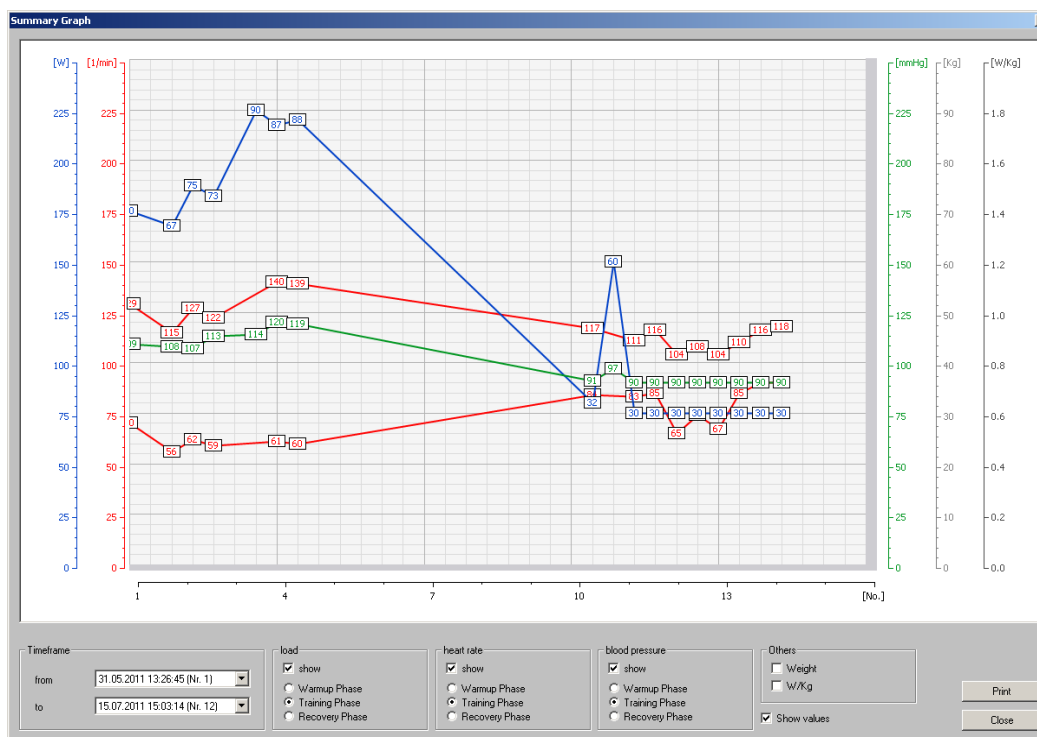


FIGURE 5.3: SUMMARY GRAPH WITH MEASURING VALUES

5.3 EXPORT (GDT), EXPORT (CSV)

For information about data export with **Export (GDT)** and **Export (CSV)**, please refer to chapter "Setup" (see "GDT mode" on page 52).

5.4 EDITING/DELETING BP VALUES

With **blood pressure**, you access the function for editing or deleting blood pressure values.

- Click **blood pressure** and select either *Edit BP Value* or *Delete BP Value*.

Each command will open a window with the BP values stored in numeric form.

- Use the arrow buttons to select the measurement.
- Edit the values.
- Save the new values with **OK** or delete the values with **OK**.

The graphic diagram and summary graph will be updated accordingly.

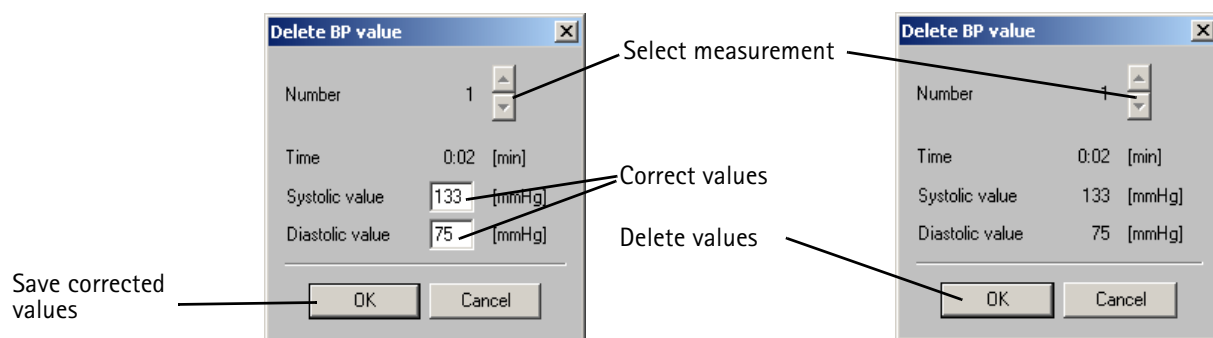


FIGURE 5.4: EDIT BP VALUE (LEFT), DELETE BP VALUE (RIGHT)

5.5 PRINTING

PRINT SETUP

You display the print setup window with the **Print** button.

- Select the settings and click **OK** to close the window.

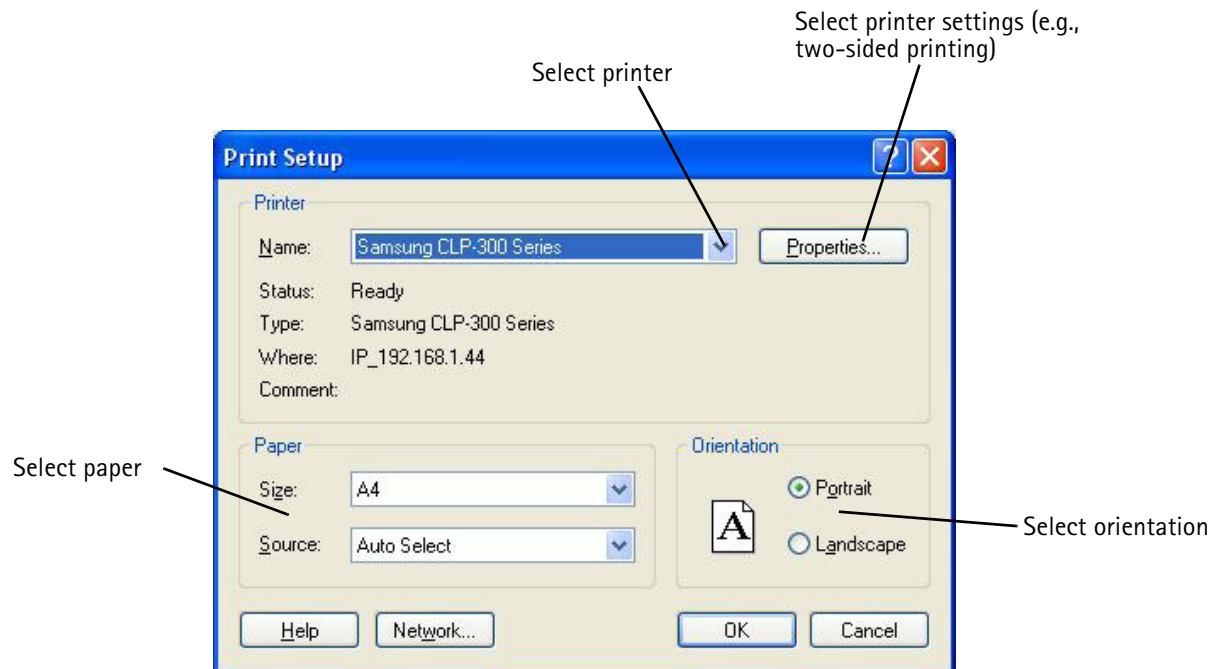


FIGURE 5.5: PRINTER SETUP

SELECTING REPORTS

From the *Training Analysis* (Figure 5.1), the following reports can be selected:

- single training
- ECG
- summary report.

A comparison of different training sessions can be printed from the *Compare Training* window (Figure 4.9).

With  you display a print preview for each report.

SINGLE TRAINING SESSION

A single training session can be printed with **Print Graph**.

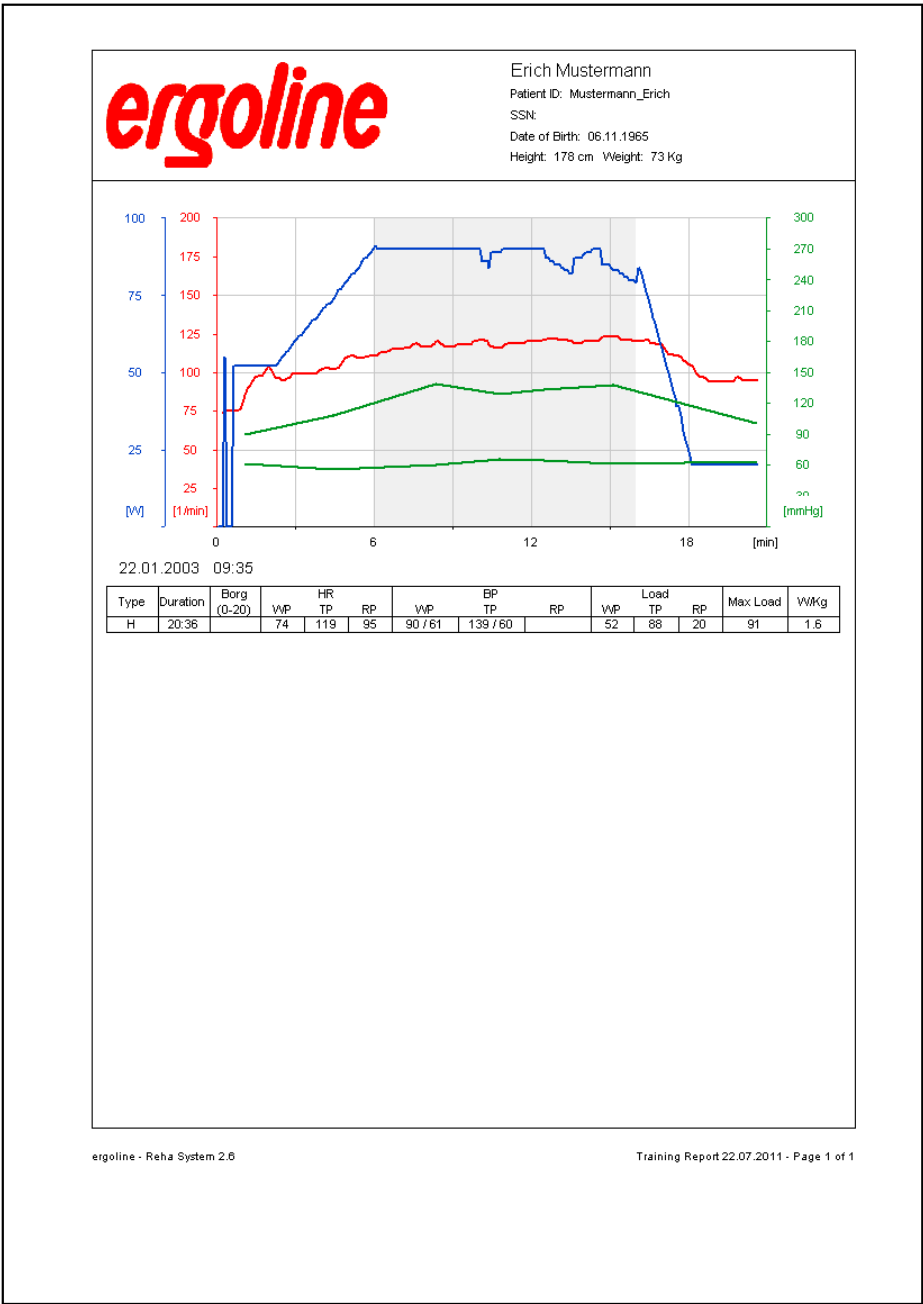


FIGURE 5.6: PRINTOUT OF A SINGLE TRAINING SESSION

ECG

An ECG can be printed with **Print ECG**.

- Select the ECG format to print: the entire ECG or the current ECG segment only (the ECG segment is selected with the scroll bar above the window).
- Select a printout with or without the training notes.

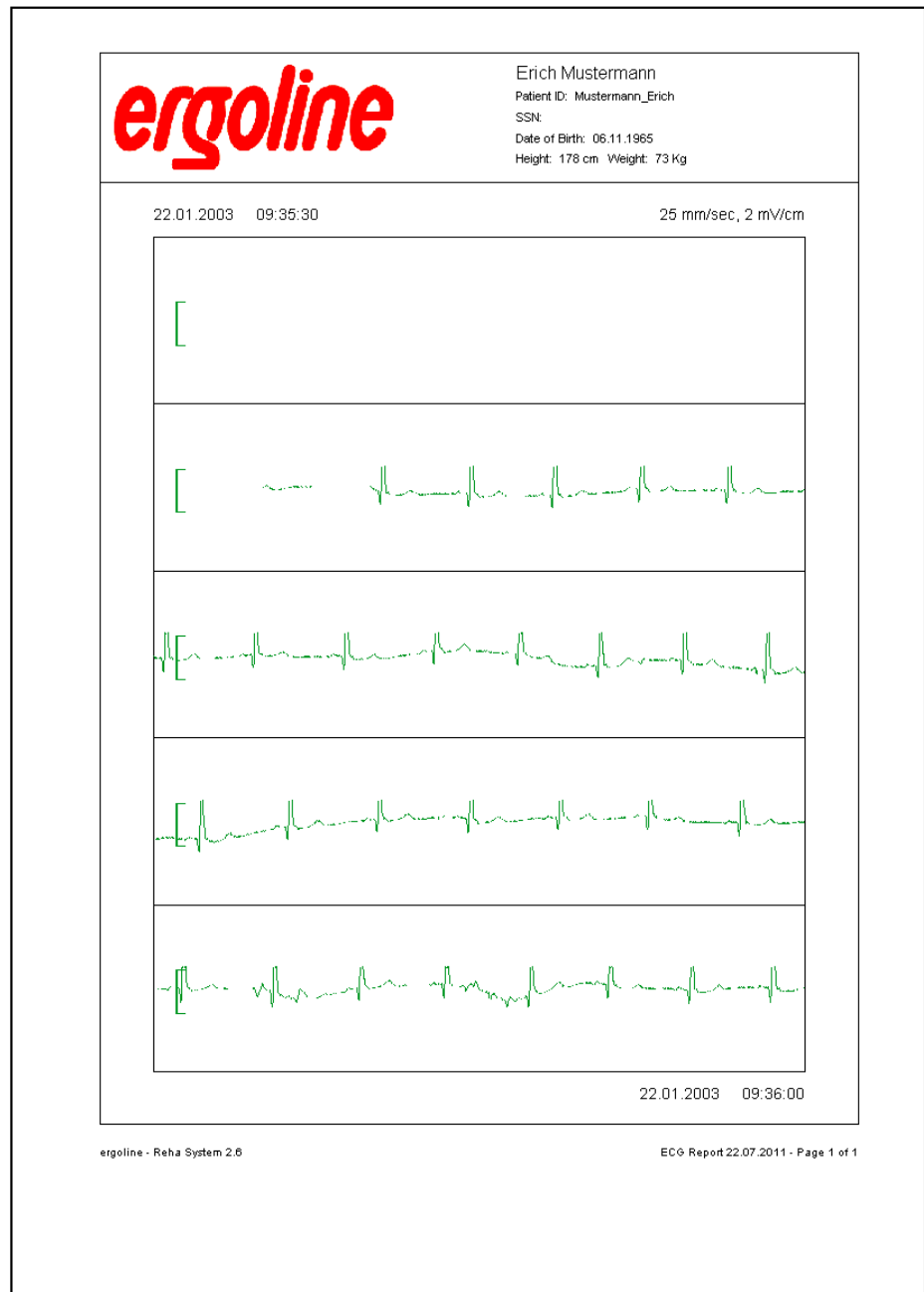
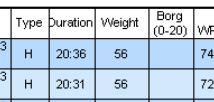


FIGURE 5.7: ECG PRINTOUT

SUMMARY REPORT

A summary report can be printed with **Print Summary**.

- Select a printout with or without the training notes.



Patient ID: Mustermann_Erich
 SSN:
 Date of Birth: 06.11.1965
 Height: 178 cm Weight: 73 Kg

No.	Date Time	Type	Duration	Weight	Borg (0-20)	HR			BP			Load			Max Load	W/Kg
						V/P	TP	RP	V/P	TP	RP	V/P	TP	RP		
9	22.01.2003 09:35	H	20:36	56		74	119	95	90 / 61	139 / 60		52	88	20	91	1.6
8	21.01.2003 10:43	H	20:31	56		72	120	96	90 / 60	140 / 61	135 / 70	54	87	20	93	1.6
7	20.01.2003 07:15	H	20:36	56		78	114	91	100 / 58		127 / 67	51	90	20	90	1.6
5	16.01.2003 10:36	H	20:36	56		79	113	99	91 / 64	122 / 59	129 / 65	44	73	20	90	1.3
4	15.01.2003 09:14	H	20:41	56		71	107	92	84 / 57	127 / 62		40	75	20	79	1.3
3	14.01.2003 07:04	H	17:02	56		77	108	89	80 / 64	115 / 56		43	67	20	75	1.2
1	10.01.2003 11:09	H	20:36	56		67	109	88	108 / 80	129 / 70	126 / 71	25	70	20	75	1.3

ergoline - Reha System 2.6

Summary Report 22.07.2011 - Page 1 of 1

FIGURE 5.8: SUMMARY REPORT PRINTOUT

6 SETUP

Settings that apply to the system as a whole can be made from the *Setup System* and from the *Setup Service* dialogs.

Click *System* to display the *Setup System* dialog, click *Service* to display the *Setup Service* dialog.



6.1 SETUP SYSTEM DIALOG

These are the features that can be configured from the *Setup System* dialog:

- Alarm acknowledge time d
- Alarm tone volume c
- printout of *Reports* with average or with maximum BP values a
- functions for the use of chip cards b
- training parameters e
- trend curve colors f.

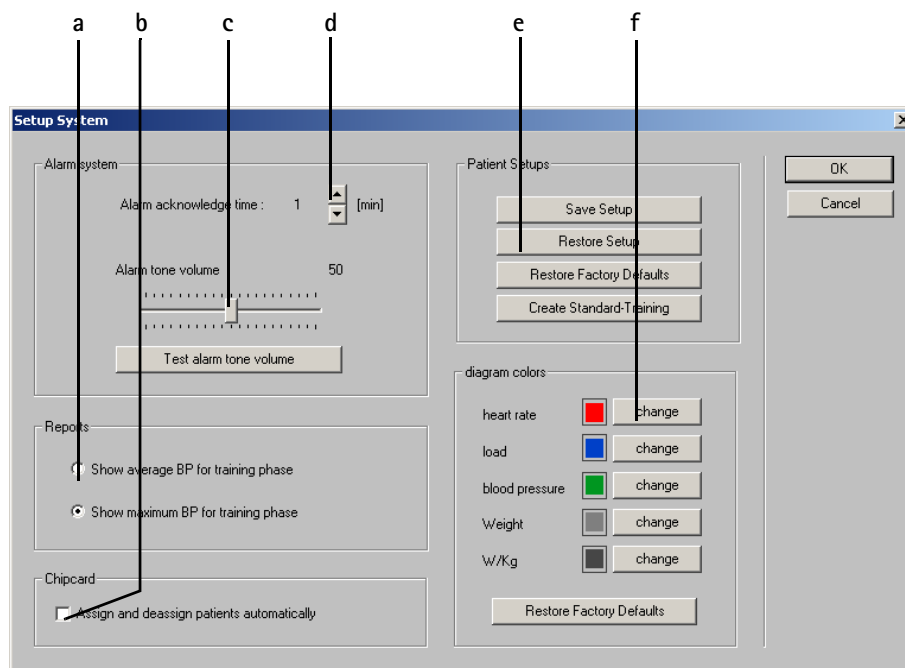


FIGURE 6.1: SETUP SYSTEM DIALOG

ALARM ACKNOWLEDGE TIME

Audible alarms will be suppressed for the period of time selected here upon activation of



ALARM TONE VOLUME

Use slider to adjust the volume of audible alarms.

TEST ALARM TONE VOLUME

Click button to hear the audio alarm at the set volume.

AVERAGE/MAXIMUM BP VALUES

The printed reports show either the average BP values (during the training phase TP) or the maximum values.

TRAINING SETUPS

Save Setup:	The training setup of the selected patient will become the default setup.
Restore Setup:	The default setup will be assigned to the currently selected patient.
Restore Factory Defaults:	The default training setup will be restored to the factory defaults.
Create Standard Training:	The default training setup will be assigned to all future patients. The default training setup can be configured when no patient is selected.

TREND CURVE COLORS

Click **change** to open the color palette.

With **Restore Factory Defaults** you restore the factory default settings.

CHIP CARD MODE

With ergoselect bicycle ergometers, patients can be assigned automatically by inserting the chip card in the ergometer and they can be removed by removal of the chip card.

Select the *Assign and deassign patients automatically* check box to enable this function (b, Figure 6.1).

6.2 SETUP SERVICE DIALOG

On the *Setup Service* screen, the user is only allowed to perform the settings and inputs listed here. All other settings and inputs (greyed out) are reserved for specially trained service personnel.

- Report heading lines **a**
- Language selection **b**
- Selection of the notch filter frequency **c**
- Ergometer configuration **d**
- Data archive **e**
- Add logo **f**
- Electrode application system **g**
- Advanced settings (data archiving, data storage, GDT mode) **h**
- Network operation **i**.

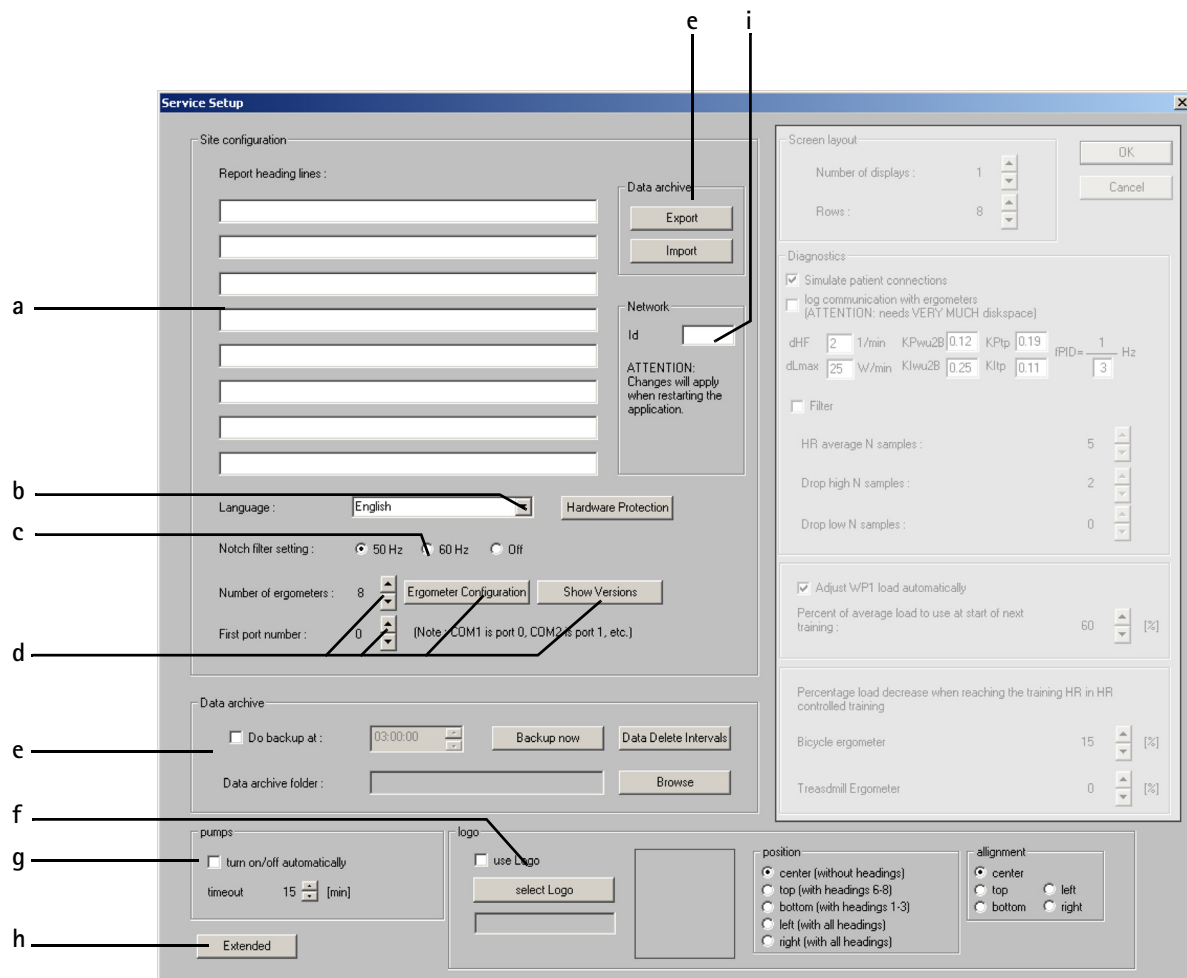


FIGURE 6.2: SETUP SERVICE DIALOG

REPORT HEADING LINES

A maximum of 8 headers can be entered here. This text will appear at the top of each report.

LANGUAGE

Choose the language.

NOTCH FILTER FREQUENCY

Used to suppress AC interference. If necessary, select the frequency of your power line.

Note

- Please note that the filter limits the transmission range. Filters should therefore only be enabled if interference is actually present.

ERGOMETER CONFIGURATION

At *Number of ergometers* you set the number of connected ergometers and at *First port number* the interface where the first ergometer is connected. If it is connected to COM1, the first port number is "0", for COM2, it is "1", etc.

With the **Ergometer Configuration** button, you open the configuration window:

- Select the ergometer number **a**.
- Select the ergometer type **b**.
- Choose the appropriate options at **c** and save the settings with **Apply**.

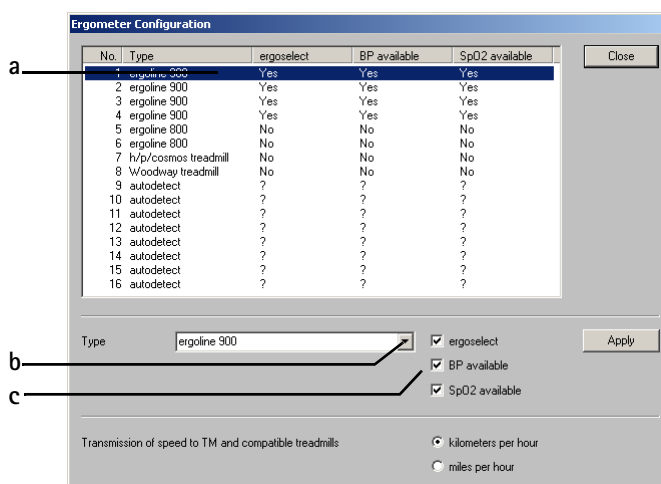


FIGURE 6.3: ERGOMETER CONFIGURATION

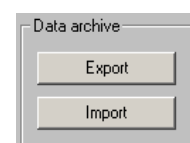
DATA ARCHIVING

Note

- By default, the data are saved to the "ergoline/ERSArchive" folder in the "Program Files" directory of the operating system (depending on the Windows version and program language, the name of the "Program Files" directory may be different).

Export patient data

- Click **Export** and select the patients whose data are to be archived (the sorting criteria "Name", "ID", "Category" and "Last Training" make it easy to create and highlight a group of patients and export their data together).



- Confirm the command with **Export**: the next dialog shows where the data were exported.

Import patient data

Patient data are imported in the same way. After confirmation with the **Import** button, the highlighted data will be imported. After the successful import of patient data, the message "Import of patients succeeded." will be displayed.

A dialog is automatically display which allows you to select the patient. From this dialog you can set the path to the appropriate archive. The corresponding archive name, e.g. "Archive_2004.10.11_001" is displayed in the dialog.

If a patient already exists in the patient directory, the corresponding patient data cannot be imported again.

Setting the path for data archiving

- Click **Expanded (h, Figure 6.2)** to open the configuration window.
- In the *Archived data* window, click *User-defined*.
- Click the folder icon to open Explorer and select the path.

With the "limit to" check box, you can limit the size of the archive to 700 MByte so that it fits on a CD.

ADD LOGO

You can add a logo to your reports. The logo must be a BMP file.

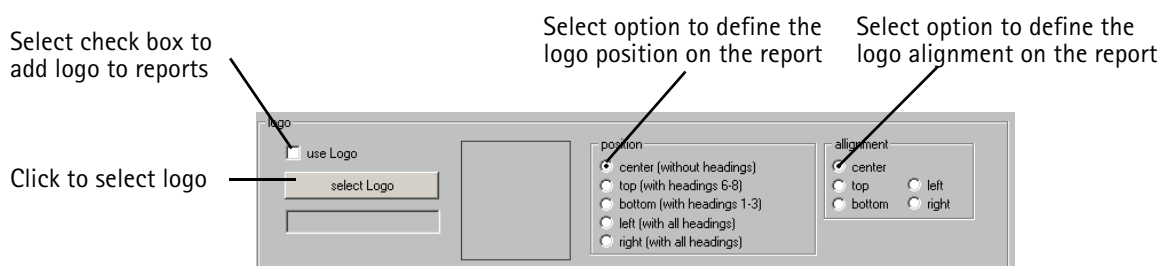


FIGURE 6.4: ADDING A LOGO

Example with logo position: "bottom, 3 headers", alignment: "left".

ergoline Academy

Continuing Education for Sports Therapy and Cardiac Rehabilitation



Erich Mustermann

Patient ID: Mustermann_Erich
SSN:
Date of Birth: 06.11.1965
Height: 178 cm Weight: 73 Kg

No.	Date Time	Type	Duration	Weight	Borg (0-20)	VVP	HR TP	RP	BP TP			VVP	Load TP	RP	Max Load	WVKg
9	22.01.2003 09:35	H	20:36	56		74	119	95	90 / 61	139 / 60		52	88	20	91	1.6
8	21.01.2003 10:43	H	20:31	56		72	120	96	90 / 60	140 / 61	135 / 70	54	87	20	93	1.6
7	20.01.2003 07:15	H	20:36	56		78	114	91	100 / 58		127 / 67	51	90	20	90	1.6
5	16.01.2003 10:36	H	20:36	56		79	113	99	91 / 64	122 / 59	129 / 65	44	73	20	90	1.3
4	15.01.2003 09:14	H	20:41	56		71	107	92	84 / 57	127 / 62		40	75	20	79	1.3
3	14.01.2003 07:04	H	17:02	56		77	108	89	80 / 64	115 / 56		43	67	20	75	1.2

FIGURE 6.5: PRINTOUT WITH LOGO

ELECTRODE APPLICATION SYSTEM

If the *turn on/off automatically* check box is selected, the pump of the electrode application system switches automatically on when a patient is assigned.

At *Timeout* you set the time after which the pump switches automatically off when no training is started for this particular patient.

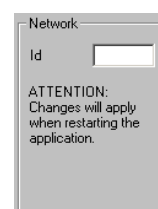
NETWORK OPERATION

Note

- *The ERS software can run on a network only if this option has been activated.*

Set Application ID

If several computers will access the patient and training data, it is necessary to assign a unique Application Id to each computer. Enter this number in the *Application Id* field.



Note

- *If you enter the same or no Application Id repeatedly or if you do not restart the ERS software after entry or change of the ID number, data may be lost.*

Setting the path for data storage

By default, the data are saved to the "ergoline/ERSArchive" folder in the "Program Files" directory of the operating system (depending on the Windows version and program language, the name of the "Program Files" directory may be different).

- Click **Expanded** (h, Figure 6.2) to open the configuration window.
- In the *Current data* window, click *User-defined*.
- Click the folder icon to open Explorer and select the path.

Note

- *The user-defined path will only be used after a restart of the ERS software. Data stored in the default directory are no longer accessible after the path was changed.*

GDT mode

GDT (German medical equipment interface) is a standard developed by QMS (medical software quality circle) which enabled platform-independent transfer of data between medical equipment and practice management software. The ERS program supports this standard.

If enabled, GDT mode ensures that patient data sent to the exchange directory by the practice management software are automatically integrated in the ERS program at program start.

Additionally, training comparisons and analyses can be sent to the practice management software.

Note

- *GDT mode is possible only when this option has been activated.*

Activating GDT mode

- Click **Expanded** (h, Figure 6.2) to open the configuration window.
- Select the *Data exchange* tab.
- Click *Activate GDT*.

To allow the two systems to communicate, the following is needed:

- a sender ID
- a recipient ID
- a data transfer location.

Application Id: ID composed of exactly 4 characters

Surgery Id: ID composed of exactly 4 characters

File extension: Count:
The extension of each file written to the exchange directory is incremented by one (".001", ".002", etc.)
GDT:
The extension of each file written to the exchange directory is ".GDT"

Directory: path to the directory for the transfer files (click folder icon to open Explorer and select path)

When GDT mode is activated, patients can be admitted to the ERS system or transferred from the practice management software. Depending on the practice workflow and to avoid duplicate patients, select the "Deactivate manual patient input" check box to exclude patient admission in the ERS program.

Data transfer via GDT

From the evaluation programs **Compare** and **Analysis** training results can be sent to the practice management program with the **Export (GDT)** button.

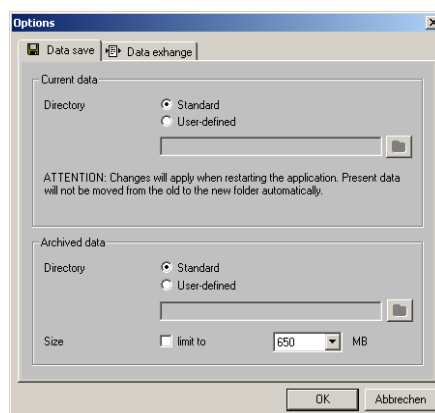


FIGURE 6.6: DATA EXCHANGE SETTINGS

In some situations, it is desirable to export analysis data in a standard file format for further processing with other software programs.

With the **Export (CSV)** button on the *Training Analysis* screen data are exported in an Excel format. You can choose the target directory in the export dialog.

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For your notes